LANDSBERG, R.S.

VIL'DT, Ye.O.; LANDSBERG, R.S.; KHROMOY, A.V.

List of Russian literature on automatic control and allied problems for 1952. Avtom. i telem. 14 no.2:249-256 Mr-Ap '53. (MLRA 10:3)
(Bibliography--Automatic control)

LANDSBERG, R.S.

VIL'DT, Ye.O.; LANDSBERG, R.S.; KHRAMOY, A.V., redaktor

Bibliography of Russian literature on automatic control and related topics, 1953. Avtom. i telem. 15 no.4:367-374 Jl-Ag '54. (MLRA 7:11)
(Bibliography--Automatic control) (Bibliography--Servomechanisms)

LANDSBERG, R.S.

AUTHORS Vil'dt, Ye.O., Landsberg, R.S., Kogan, B.Ya. 103-9-9/9

TITLE Bibliography. A List of Soviet-, and Foreign Literature Dealing with Problems of Mathematical Computation (Modelling) for the Year 1955. (Bibliografiya. Spisok otechestvennoy i inostrannoy literatury po voprosam matematicheskogo modelirovaniya za 1955 g.-Russian)

PERIODICAL Avtomatika i Telemekhanika, 1957, Vol 18, Nr 9, pp 859-872 (U.S.S.R.)

ABSTRACT The list contains: 1) Books, 2) Publications by congresses and conferences, 3) General theoretical problems: a) General problems, b) Methods of solving problems by means of modelling devices, c) Precision of operation of modelling devices and their elements, 4) Modelling electron devices consisting of individual computation elements, 5) Computation elements of modelling electron devices: a) Direct current electron amplifiers, b) Computation amplifiers without tubes, c) Multiplication-and devision-devices, d) Function-transformers, e) Other computing elements, 6) Electromechanical modelling devices (electromechanical continuous computers, 7) Special continuous computers: a) Devices for the solution of systems of algebraic equations, extraction of roots, b) Correlators, c) Trenajeurs (simulators), 8) Devices for the transition of a cipher code to physical quantities and vice versa, 9) Comparison of cipher machines and analogies, 10) Auxiliary devices, 11) Application of modelling devices: a) For the solution of problems connected with automatic control, b) Application of modelling devices and their elements in aeronautics, c) Application of modelling devices and their elements for the so-

Card 1/2

Bibliography.A List of Soviet-, and Foreign Literature 103-9-9/9
Dealing with Problems of Mathematical Computation(Modelling)for
the Year 1955.

lution of various problems.

AVAILABLE Library of Congress.
Card 2/2

AUTHORS: Bil'dt, Ye. O., Landsberg, R. S. 103-19-5-14/14

TITLE: A Bibliography of Publications Concerning Problems of Mathematical Simulation (For Computers in Continuous Operation) Published in 1956
[Bibliografiya literatury po voprosam matematicheskogo modelirovaniya (po vychislitel'nym mashinam nepreryvnogo deystviya) za 1956]

PERIODICAL: Avtomatika i Telemekhanika, 1958, Vol. 19, Nr 5, pp. 493-516 (USSR)

ABSTRACT:
I. Books.
6 new books, two of which are Soviet, are enumerated here.
II. Transaction of Congresses and Conferences. 11 non-Soviet publications are enumerated here.
III. General Theoretical Problems. 60 publications, 12 of which are Soviet, are enumerated here.
IV. Electronic simulators. 50 publications, 4 of which are Soviet, are enumerated here.
V. The calculating elements of electronic computers. 93 publications, 11 of which are Soviet are enumerated here.

Card 1/2

A Bibliography of Publications Concerning Problems of Mathematical Simulation (For Computers in Continuous Operation) Published in 1956 103-19-5-14/14

VI. Electromechanical Computers. 9 publications, 1 of which is Soviet, are enumerated here.
VII. The specialization of computers for continuous operation. 19 publications, 4 of which are Soviet, are enumerated here.
VIII. Devices for the transition from a numerical code to physical quantities and inversely. 20 non-Soviet references are given here.
IX. The application of simulators. 78 references, 15 of which are Soviet, are given here.
X. Mathematical models as a basis for direct analogy. 71 publications, 10 of which are Soviet, are given here.
XI. Numerical simulation. 4 non-Soviet references are given here.
XII. Bibliography. 4 bibliographical publications, 2 of which are Soviet, are enumerated here.

AVAILABLE: Library of Congress

Card 2/2 1. Mathematical computers—Bibliography

USCOMM-DC-55, 166

VIL'DTYE, O.; LANDSBERG, R.S.; KHRAMOY, A.V.

Bibliography on automatic control and neighboring fields published during 1956. Avtom. i telem. 20 no.4:528-551 Ap '59. (MIRA 12:5)
(Bibliography--Automatic control)

S/103/60/021/012/007/007
B012/B064

AUTHORS: Vil'dt, Ye. O., Landsberg, R. S., Kogan, B. Ya.

TITLE: Bibliography. List of Publications on Problems of the Mathematical Simulating (on Analog Computers) of 1958

PERIODICAL: Avtomatika i telemekhanika, 1960, Vol. 21, No. 12, pp. 1629-1652

TEXT: Total number of articles published: 446. 10 books are listed. Transactions of congresses and conferences, information: 18; general theoretical problems: 72 (general problems: 43, methods of solving problems by means of analog computers: 18, accuracy of analog computers and their elements: 11; analog computers with non-direct analogy: 181 (electronic devices: 45, computing elements of electronic devices: 92 (electronic direct-current amplifiers: 15, transistor computing amplifiers: 8, integrating and differentiating devices: 8, multiplication and division devices: 18, function generators: 34, other computing elements and auxiliary equipment: 9), electromechanical devices: 11, air-pressure hydraulic devices: 2, special devices: 31 (computers for solving systems

Card 1/2

Bibliography. List of Publications on Problems of the Mathematical Simulating (on Analog Computers) of 1958

S/103/60/021/012/007/007
B012/B064

of algebraic equations, root, finders: 13, computers for solving integral equations: 9, correlators: 4, various computers: 5)); devices for the transition from the digital code to physical quantities and vice versa: 35; use of analog computers with non-direct analogy: 116 (use of analog computers for solving problems of automatic control: 28, use of analog computers and their elements in aviation: 11, use of analog computers in nuclear engineering: 27, various applications: 50); digital analog computers: 13; bibliography: 1.

V

Card 2/2

LANDSBERG, Ye.A.

Chondroma of the bronchus. Vest. oto-rin. 16 no.5:79-80 S-O '54.
(MLRA 7:12)
(CHONDROMA, bronchi)
(BRONCHI, neoplasms, chondroma)

LANDSBERG, Ye.A., starshiy leytenant meditsinskoy sluzhby

Furacillin for treating chronic purulent mesotympanitis. Voen.-med. zhur. no.7:88-89 Jl '56. (MLRA 9:11)
(FURALDEHYDE) (EAR--DISEASES)

AUTHORS: Kalashnikov, S. G., Landsberg, Ye. G. SOV/57-28-7-4/35

TITLE: Investigation of the Photo-Magneto-Electric Effect as a Method for the Determination of the Volume Length of Diffusion in Germanium (Issledovaniye fotomagnitoelektricheskogo effekta kak metoda opredeleniya ob"yemnoy dliny diffuzii v germanii)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1958, Vol. 28, Nr 7, pp. 1387 - 1393 (USSR)

ABSTRACT: The applicability of the photo-magneto-electric effect (PME) for the determination of the volume length of the diffusion was checked specially. It was the object of the paper as well to check final conclusions of the theory of the PME (Ref 11) essential for this purpose and to compare the values obtained for the diffusion lengths to those of other methods. The experiments were carried out on the basis of germanium. For the determination of the diffusion length the method of simultaneous measurement of the PME and the photoconductivity (PC)(Ref 18) was chosen. This method made possible the elimination of the influence of the surface recombination on the illuminated surface and does not require an illumination measuring of the samples. Furthermore the dark resistance of the illuminated

Card 1/3

Investigation of the Photo-Magneto-Electric Effect as SOV/57-28-7-4/35
a Method for the Determination of the Volume Length of Diffusion in Germanium

part of the sample (R_o) and the PME-voltage (V) were measured. R_o was measured in separate experiments with the aid of sound devices and a potentiometer. The experiments showed that in the case of samples with admixtures the PME-voltage of the illumination is proportional up to its maximum value ($\sim 1.10^{17}$ pairs/cm^2 sec.). In the case of samples of the same kind a disturbance of the linear dependence was observed at $\sim 10^{16}$ pairs/cm^2 sec. Afterwards the PME-voltage was almost independent of the illumination. The PME-voltage was proportional to the total number of photons. The experiments showed that a strict proportionality dominates between V and the magnetic field strength H. In the case of a change of direction of the field V maintained its value, changed, however, its sign. This points to the absence of noticeable quadratic effects. The method mentioned was compared to the photoelectric method (Ref 31) and it is shown that the results of the two methods agree satisfactorily. The method given has moreover the following advantages: it does not subject the contacts to considerable wear, it permits to carry out measurements of very small diffusion lengths

Card 2/3

Investigation of the Photo-Magneto-Electric Effect as a Method for the Determination of the Volume Length of Diffusion in Germanium

SOV/57-28-7-4/35

with equal ease and does not demand complicated apparatus in the case of to a great extent alloyed samples. A. I. Morozov helped to build the apparatus. V. G. Alekseyeva put the germanium samples at the authors' disposal. There are 4 figures, 2 tables, and 39 references, 14 of which are Soviet.

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR (Institute of Radio Engineering and Electronics, AS USSR)

SUBMITTED: February 1, 1958

1. Germanium---Diffusion

Card 3/3

LANDSBERG, Ye.G.; BONCH-BRUYEVICH, V.L.

Effect of the physical dimensions of samples on the measurement of photo diffusion length by means of the photomagnetic method. (MIRA 13:10)
Fiz. tver. tela 2 no.5:848-853 My '60.
(Semiconductors)

LANDSBERG, G. S., KALASHNIKOV, Sergey G., ADEYEVA, N. G., and KARPOVA, I. V.

"Recombination Properties of Manganese and Gold in Germanium."

Report to be submitted for the Intl. Conference on Photoconductivity, IUPAP, Cornell University, Ithaca, N. Y., 21-24 Aug 1961.

Kalashnikov, S. G.- Hd. Semiconductor Group, Moscow State Univ.

23126
S/181/61/003/005/031/042
B108/B209

9,4300 (1143, 1151, 1136)

AUTHORS: Landsberg, Ye. G. and Kalashnikov, S.G.

TITLE: Electron capture cross section of manganese atoms in germanium

PERIODICAL: Fizika tverdogo tela, v. 3, no. 5, 1961, 1566 - 1570

TEXT: The authors studied the temperature dependence of the electron lifetime in p-type germanium containing high-purity manganese. The manganese concentration was determined from the variation in the temperature dependence of the Hall constant. For this purpose, an ingot with a given antimony concentration was prepared, whose electron concentration n_o (equaling the difference between donor and acceptor concentrations $N_d - N_a$) was measured. After this, manganese was added so that the lower manganese level was partly filled with electrons. Fig. 1 shows the result. The obtained concentration of manganese atoms, N_t, corresponds to a distribution coefficient, k, of about $1.5 \cdot 10^{-6}$. Gallium was introduced

Card 1/5

Electron capture cross...

into the crystals in order to obtain samples with a known hole concentration. The Hall constant was measured in a field of 3600 oersteds. After this the crystals were melted, and manganese was added. The properties of the samples are given in the Table. The lifetime was measured by a method of compensating the voltage of the photomagnetic effect and the photoconductivity (Ref. 4: S. G. Kalashnikov, Ye. G. Landsberg. ZhTF, XXVIII, 1387, 1958). Measurements were made in the temperature interval of from 95 to 330°K and showed a decrease in electron lifetime with rising manganese content. The manganese atoms in p-type germanium were found not to give rise to a noticeable adhesion. Considering that, according to Ref. 1 (H. H. Woodbury a. W. W. Tyler. Phys. Rev., 100, 659, 1955), manganese produces two levels in germanium ($E_1 - E_v = 0.16$ ev and $E_c - E_2 = 0.37$ ev), the theoretical expression for the lifetime under the present conditions reads: $\tau = \frac{p_o + p_1}{C_{n1}p_o + C_{n2}p_1}$ (1), where $C_{n1} = NvS_{n1}$; $C_{n2} = NvS_{n2}$; S_{n1} and S_{n2} are the electron capture cross sections for the lower and the

Card 2/5

Electron capture cross...

upper level, respectively; v is the velocity of thermal motion of electrons; $p_1 = \frac{g_1}{g_o} N_v \exp\frac{E_v - E_1}{kT}$ (2); g_1 and g_o are the degeneration multiplicity factors of the completed and of the empty level E_1; N_v denotes the effective phase density in the valence band. The capture cross sections calculated from experimental data on lifetime and manganese concentration were found to be $S_{n1} = 2 \cdot 10^{-16}$ cm^2 (90°K) and $S_{n2} = 4 \cdot 10^{-17}$ cm^2 (300°K). The mean velocity of thermal motion of electrons at 300°K was taken to be $1.07 \cdot 10^7$ cm/sec. The results showed only a slight temperature dependence of the capture cross sections, which is typical of deep acceptor levels in germanium. The lower level is ascribed to Mn^- ions, and the upper one to Mn^{2-} ions. The high capture cross section S_{n1} is explained by a theory established by M. Lax (Ref. 10: J. Phys. Chem. Sol., 8, 66, 1959) who considered capture to be a sequence of single-phonon processes in which excited centers take part. The S_{n2} capture (electron capture on Mn^- ions) is ascribed to the tunnel effect in the presence of a Coulomb barrier.

Card 3/5

Electron capture cross...

There are 3 figures, 1 table and 20 references: 8 Soviet-bloc and 11 non-Soviet-bloc.

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR Moskva (Institute of Radio Engineering and Electronics AS USSR, Moscow)

SUBMITTED: November 30, 1960

Table.

Номер образца 1)	Концентрация дырок p_o, см$^{-3}$ 2)	Концентрация марганца N_t, см$^{-3}$ 3)	Время жизни τ_{n02}, мксек. 4)	Время жизни τ_{n01}, мксек. 5)	Плотность дислокаций Nd, см$^{-2}$ 6)
1	$1.0 \cdot 10^{15}$	$5.0 \cdot 10^{13}$	50	15	80
2	$1.4 \cdot 10^{15}$	$1.0 \cdot 10^{14}$	26	7.5	900
3	$2.8 \cdot 10^{15}$	$2.0 \cdot 10^{14}$	15	4.8	800
4	$2.1 \cdot 10^{15}$	$2.6 \cdot 10^{14}$	12	3.6	100
5	$4.8 \cdot 10^{15}$	$6.0 \cdot 10^{14}$	4.8	1.5	500
6	$6.0 \cdot 10^{15}$	$1.1 \cdot 10^{15}$	2.0	0.7	1200

Legend: 1)Number of sample; 2)hole concentration p_o, cm^{-3}; 3)manganese concentration N_t, cm^{-3}; 4)lifetime τ_{n02}, μsec; 5)lifetime τ_{n01}, μsec; 6)density of dislocations Nd, cm^{-2}.

Card 4/5

S/181/63/005/004/014/047
B102/B186

AUTHORS: Landsberg, Ye. G., and Kalashnikov, S. G.

TITLE: Recombination properties manganese in germanium

PERIODICAL: Fizika tverdogo tela, v. 5, no. 4, 1963, 1067 - 1076

TEXT: The electron - hole recombination on manganese atoms in n-type germanium single crystals was investigated by two methods: by the stationary photomagnetic effect and photoconductivity, and by the photoconduction attenuation. The crystals investigated were grown according to the Czochralski method (growth axis [111]) and contained antimony with manganese impurities, the latter in concentrations between $8.0 \cdot 10^{13}$ and $1.0 \cdot 10^{15}$ cm^{-3}. The electron concentrations of the samples under investigation were varied between $2.0 \cdot 10^{15}$ and $2.5 \cdot 10^{14}$ and the dislocation densities between $2 \cdot 10^{2}$ and $1.7 \cdot 10^{3}$ cm^{-2}. The hole trapping factor α_p^- for trapping by Mn^{2-} ions was determined at 300°K; it lies between 7.9 and $4.7 \cdot 10^{-10}$ $cm^3 sec^{-1}$ and depends exponentially on the temperature (the exponents vary between 5.1 and 4.2). For trapping by Mn^- ions the electron trapping coefficient

Recombination properties...

α_n^- lies between 0.5 and $1.8 \cdot 10^{-10}$ $cm^3 sec^{-1}$ (at 300°K) and is a weak temperature function. When the temperature is reduced the Mn^- ions show an adhesion effect for holes. Photoconduction damping in the case of self-excitation leads to a value of α_n^- of the same order of magnitude as the stationary method and verifies the weak temperature dependence. There are 8 figures and 3 tables.

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR Moskva (Institute of Radio Engineering and Electronics AS USSR, Moscow)

SUBMITTED: October 26, 1962

ACC NR: AP6033587 SOURCE CODE: UR/0181/66/008/010/3138/3140

AUTHOR: Alekseyeva, V. G.; Landsberg, Ye. G.

ORG: Institute of Radio Engineering and Electronic AN SSSR, Moscow (Institut radiotekhniki i elektroniki AN SSSR)

TITLE: Certain electric and photoelectric properties of the compound SbSI

SOURCE: Fizika tverdogo tela, v. 8, no. 10, 1966, 3138-3140

TOPIC TAGS: antimony compound, photoelectric property, semiconductor single crystal, ferroelectricity, resistivity, activation energy, Hall effect, electron mobility, absorption band

ABSTRACT: The authors have investigated the electric and photoelectric properties of single crystals of SbSI in the ferroelectric region. Small amounts of LiI were introduced into some of the single crystals. The temperature dependence of the resistivity was measured in the 15 - 40C range. The resistivity decreased exponentially with increasing temperature, with an activation energy close to that obtained by J. Sasaki (Japan J. Appl. Phys. v. 4, 228, 1965 and earlier). The carrier mobility could be determined from the Hall effect only for lithium-doped crystals and amounted to 50 - 100 $cm^2/v\text{-}sec$. The sign of the Hall emf corresponded to n-type conductivity. The photoconductivity of lithium doped crystals, measured after prolonged storage in

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ACC NR: AP6033587

darkness, was 10 - 20 times larger than that of the pure samples. Both samples showed smearing of the long-wave edge of the absorption band and a rapid decrease in the photocurrent in the short-wave side corresponding to the intrinsic absorption. The low short-wave sensitivity is attributed to surface recombination. The decrease in photoconductivity has a complicated character. Measurements of the thermally stimulated conductivity disclosed the presence of adhesion centers, but they were unstable and disappeared under the influence of light or heating. The experimental results are interpreted from the point of view that both doped and undoped samples contained two types of defects, stable and unstable, and the latter are strongly affected by illumination. The authors thank S. G. Kalashnikov for a discussion of the results. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 12Mar66/ ORIG REF: 001/ OTH REF: 004

Card 2/2

LANDSBERG, Ye. S.; GUSEYNOV, D.

Chemistry

"Efficient Cracking Installation" (In Azerbaydzhan Language) Gostoptekhizdat, 1948

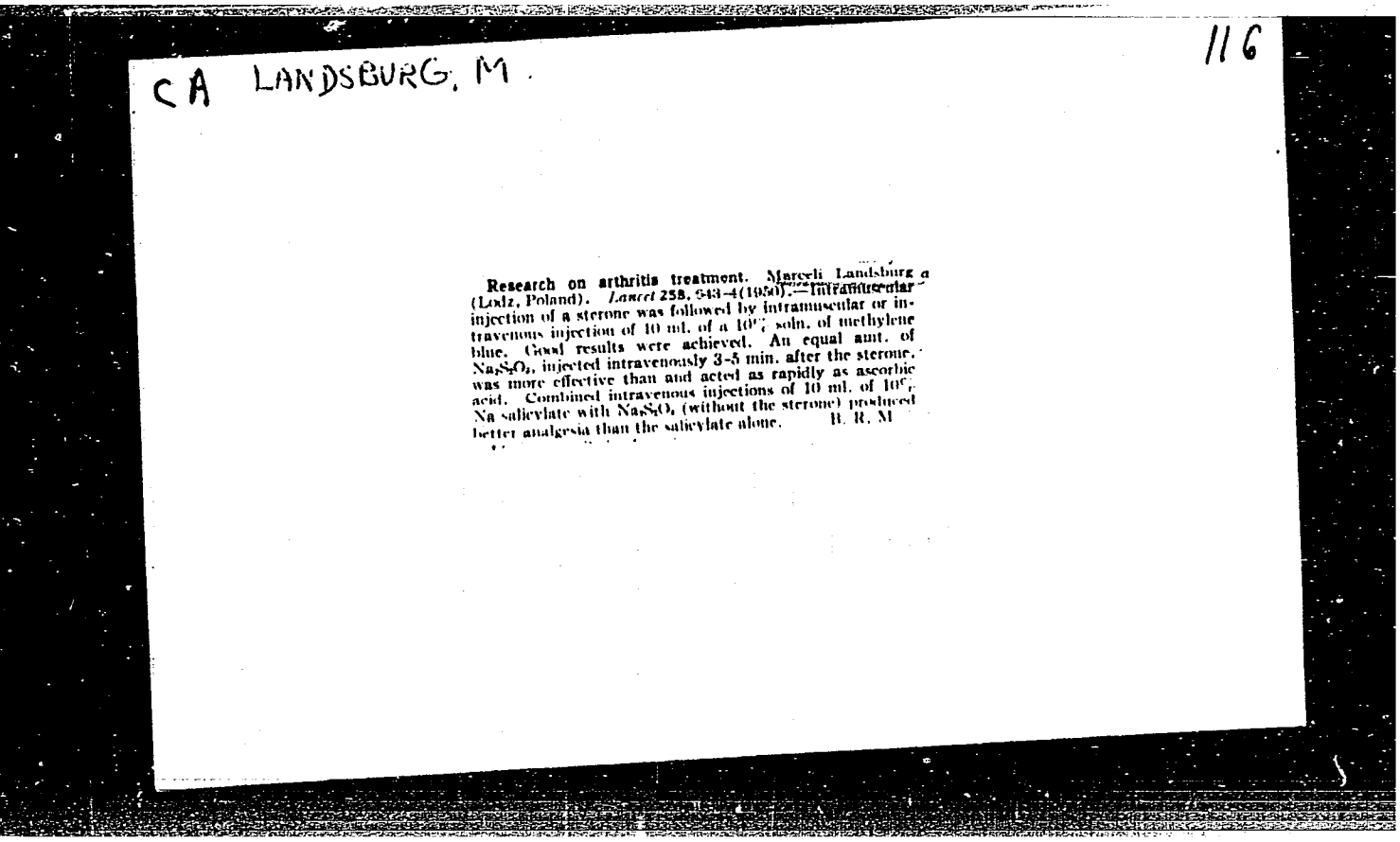
Summary No. 60, 26 May 52; BR-2056899

LANDSBERG, Ye. S.

LANDSBERG, Ye. C.

Photomagnetic method for measuring the lifetime of electrons and holes. Zav.lab. 27 no.10:1224-1227 '61. (MIRA 14:10)

1. Institut radiotekhniki i elektroniki AN SSSR.
(Electrons)



CA LANDSBURG, M.

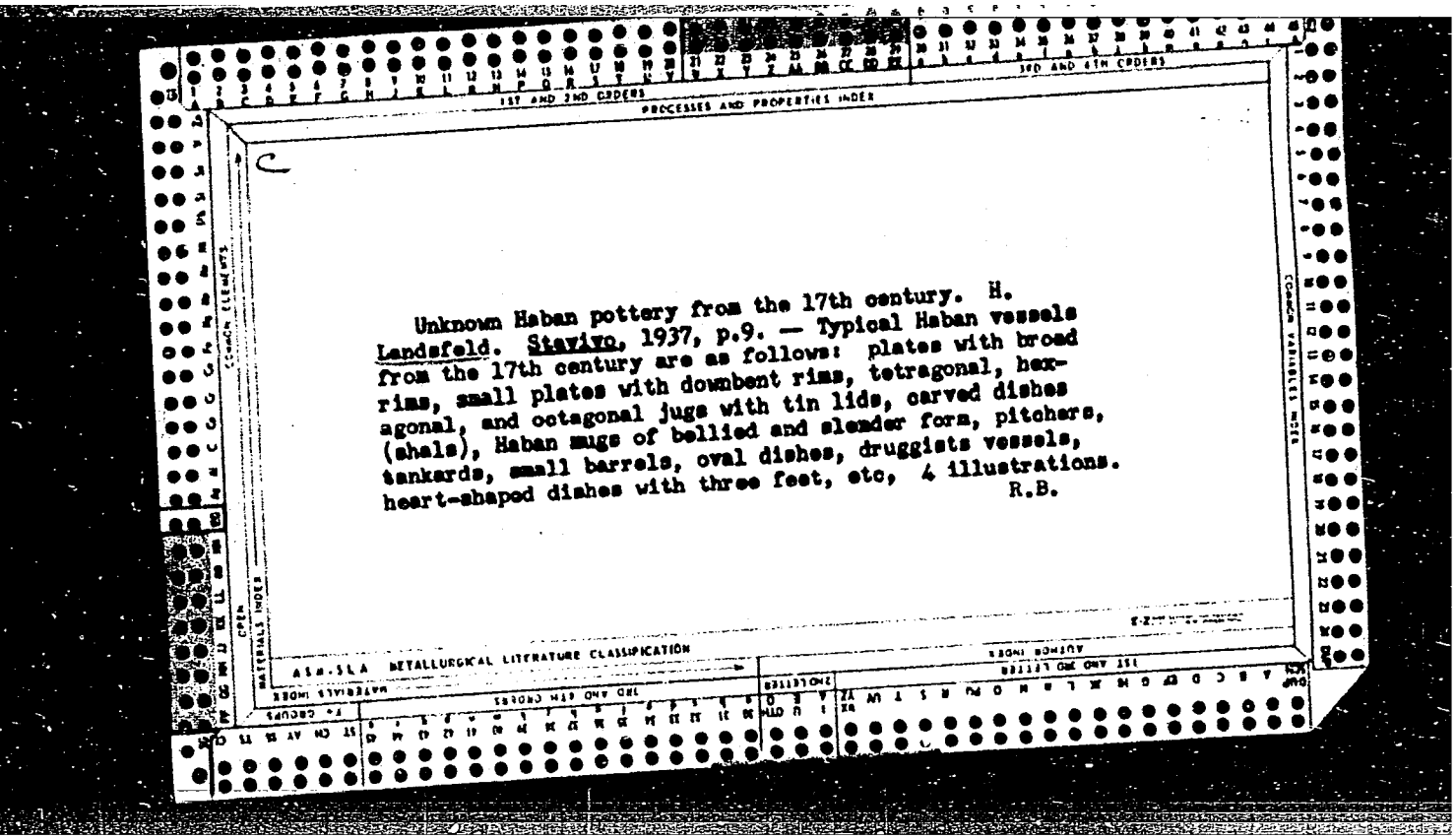
116

Research on arthritis treatment. Marceli Landsburg a (Lodz, Poland). *Lancet* 258, 543–4(1950).—Intramuscular injection of a sterone was followed by intramuscular or intravenous injection of 10 ml. of a 10% soln. of methylene blue. Good results were achieved. An equal amt. of $Na_2S_2O_3$, injected intravenously 3–5 min. after the sterone, was more effective than and acted as rapidly as ascorbic acid. Combined intravenous injections of 10 ml. of 10% Na salicylate with $Na_2S_2O_3$ (without the sterone) produced better analgesia than the salicylate alone. B. R. M

LANDSBERG, S.

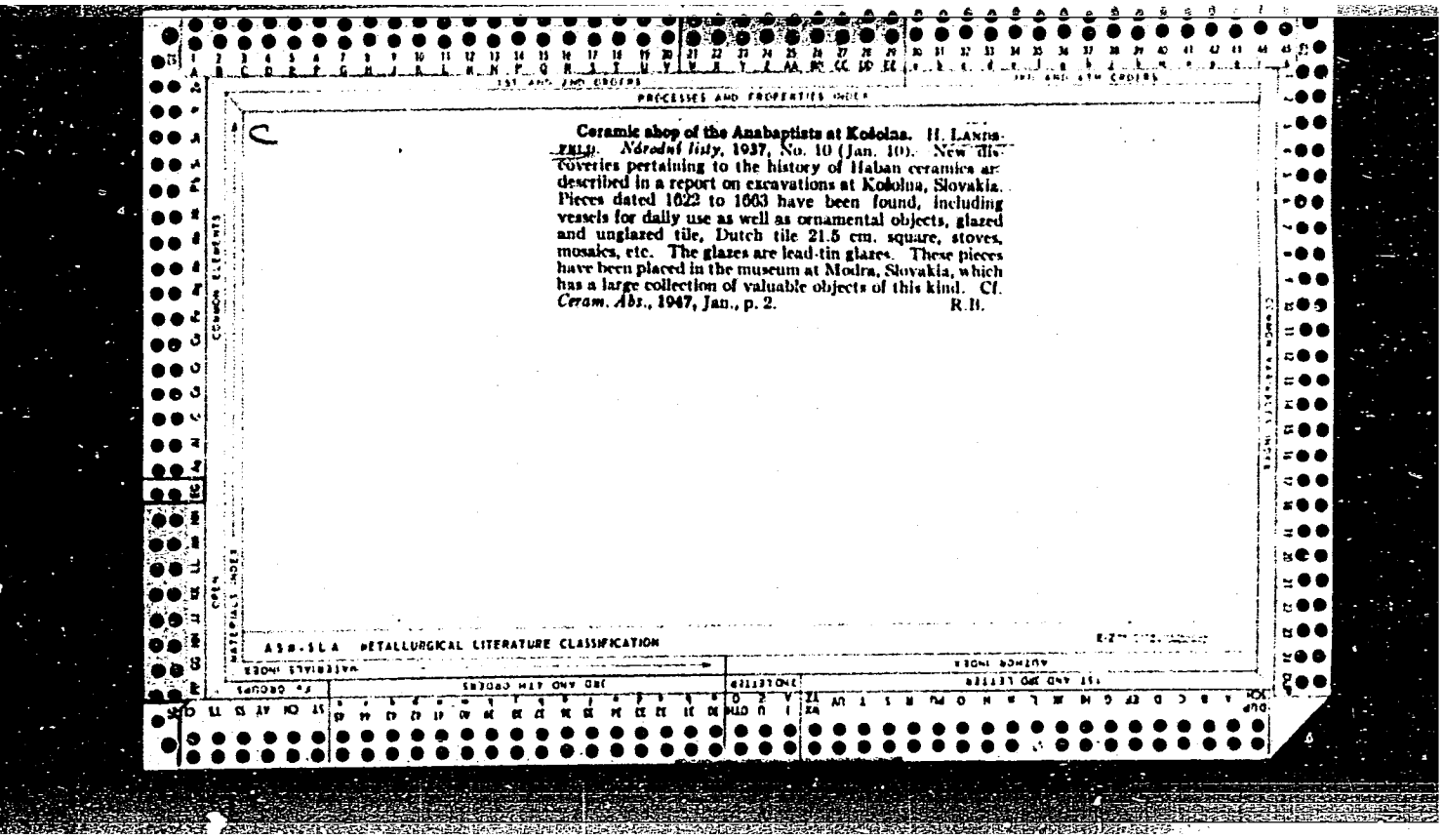
"Optical methods of research on molecules. Tr. from the Russian", p. 448;
"Issued by the Rumanian Society of Mathematics and Physics, Monthly".
(GAZETA MATEMATICA SI FIZICA, SERIA A. Vol. 6, no. 10, 1954 Bucuresti, Rumania).

SO: Monthly List of East European Accession, (EEAL), LC, Vol. 4, No. 5,
May, 1955.

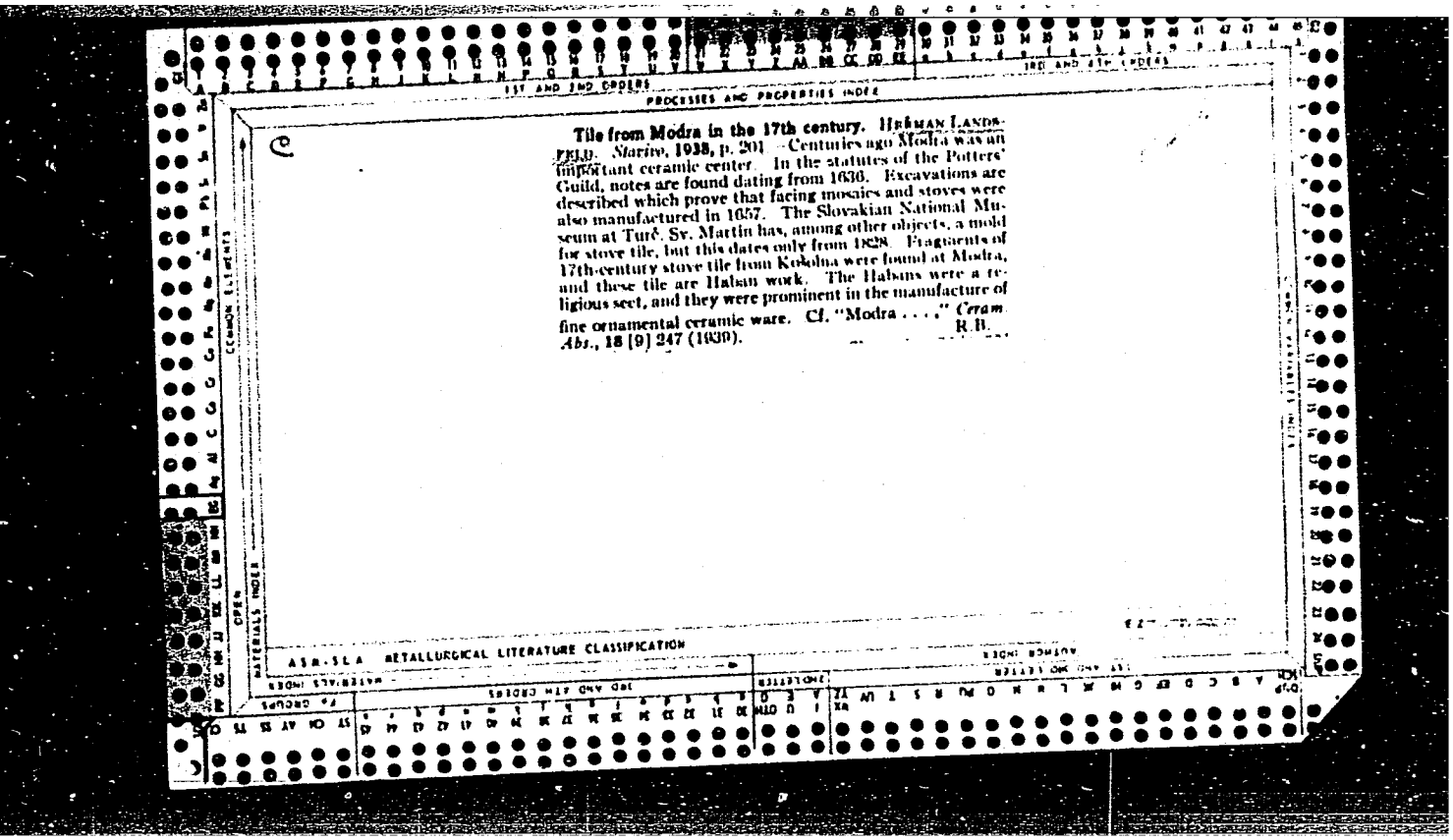


Unknown Haban pottery from the 17th century. H. Landsfeld. Staviro, 1937, p.9. — Typical Haban vessels from the 17th century are as follows: plates with broad rims, small plates with downbent rims, tetragonal, hexagonal, and octagonal jugs with tin lids, carved dishes (shals), Haban mugs of bellied and slender form, pitchers, tankards, small barrels, oval dishes, druggists vessels, heart-shaped dishes with three feet, etc, 4 illustrations.

R.B.



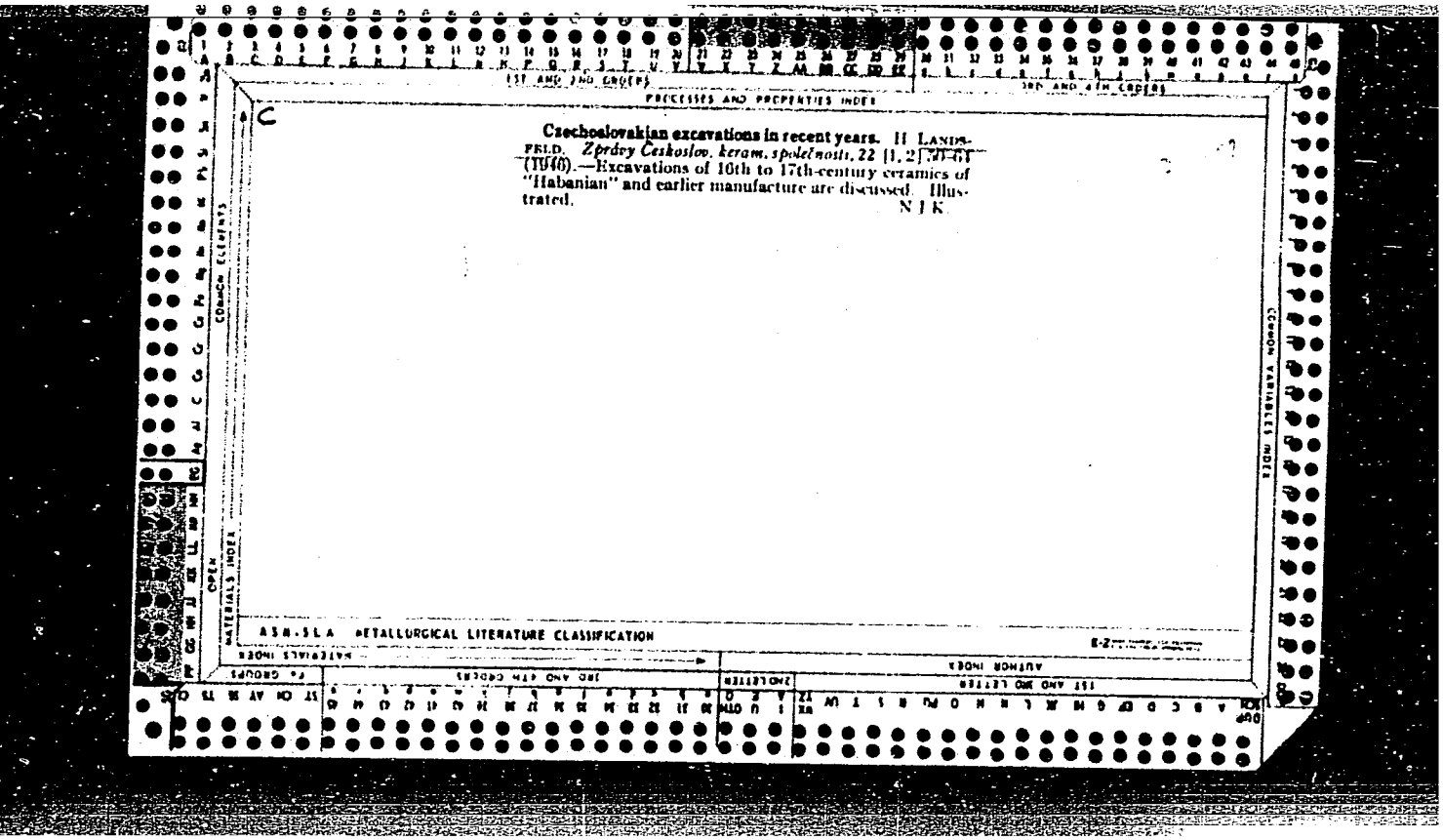
Ceramic shop of the Anabaptists at Kokolna. H. Lanna. *Národní listy*, 1937, No. 10 (Jan. 10). New discoveries pertaining to the history of Haban ceramics are described in a report on excavations at Kokolna, Slovakia. Pieces dated 1622 to 1663 have been found, including vessels for daily use as well as ornamental objects, glazed and unglazed tile, Dutch tile 21.5 cm. square, stoves, mosaics, etc. The glazes are lead-tin glazes. These pieces have been placed in the museum at Modra, Slovakia, which has a large collection of valuable objects of this kind. Cf. *Ceram. Abs.*, 1947, Jan., p. 2. R.B.



PROCESSES AND PROPERTIES INDEX

Tile from Modra in the 17th century. HERMAN LANDSFELD. *Starožitnosti*, **1938**, p. 201.—Centuries ago Modra was an important ceramic center. In the statutes of the Potters' Guild, notes are found dating from 1636. Excavations are described which prove that facing mosaics and stoves were also manufactured in 1657. The Slovakian National Museum at Turč. Sv. Martin has, among other objects, a mold for stove tile, but this dates only from 1828. Fragments of 17th-century stove tile from Kobolna were found at Modra, and these tile are Halsan work. The Halsans were a religious sect, and they were prominent in the manufacture of fine ornamental ceramic ware. Cf. "Modra . . . ." *Ceram. Abs.*, **18** [9] 247 (1939). R.B.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

C

Czechoslovakian excavations in recent years. H LANDSFELD. *Zprávy Československ. keram. společnosti*, 22 [1, 2] [27-61] (1946).—Excavations of 10th to 17th-century ceramics of "Habanian" and earlier manufacture are discussed. Illustrated.
N J K

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Bcs

Pottery

339. Clay moulds in folk pottery.—H. LANDSFELD (*Slavivo*, **28**, 229, 1950). Clay moulds for the figurines made by folk potters in Slovakia are described. Ceramic moulds made for domestic cooking are also considered.

LANDSFELD, H.

Potters' marks and signs on Habanian ceramics. p. 83.
SLOVENSKY NARODOPIS, Bratislava, Vol. 3, no. 1, 1955.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, no. 10, Oct. 1955, Uncl.

LANDSFELD, H.

"A contribution to the clarification of problems concerning the production of pottery in Nove Hvezdlice during the 18th century."

p. 212 (Cesky Lid) Vol. 44, no. 5, 1957
Prague, Czechoslovakia

SO: Monthly Index of East European Accessions (EEAI) LC. Vol. 7, no. 4, April 1958

LANDSHMAN, N.K.

Role of the spinal ganglia in the sensory innervation of the internal organs. Arkh.anat.gist.i embr. 37 no.10:29-40 O '59. (MIRA 13:4)

1. Kafedra gistologii i embriologii (zaveduyushchiy - chlen-korrespondent AN SSSR prof. G.K. Khrushchov, rukovod.raboty T.A. Grigor'yeva) II Moskovskogo Gosudarstvennogo meditsinskogo instituta im. N.I. Pirogova. (Adres avtora: Moskva, Malaya Pirogovskaya ul. 1, II Moskovskiy gosudarstvennyy meditsinskiy institut, kafedra gistologii).

(GANGLIA SPINAL physiol.)

LANDSHMAN, N. K., Cand Med Sci -- (diss) "Segmentary appliance of spinal sensory fibers which pass through the ganglia of the sympathetic nerve system." Moscow, 1960. 12 pp; (Academy of Medical Sciences USSR); 200 copies; price not given; (KL, 26-60, 143)

ZELENIN, A.V.; LANDSHMAN, N.K.

Analyzing the picture of spinal sensory ganglia as observed in the fluorescence microscope. Zhur. ob. biol. 21 no.6:461-464 N-D '60. (MIRA 14:1)

1. Kafedra gistologii i TSentral'naya nauchno-issledovatel'skaya laboratoriya 2-go Moskovskogo Gosudarstvennogo meditsinskogo instituta im. N.I.Pirogova.
(SPINAL CORD) (FLUORESCENCE MICROSCOPY)

LANDSHMAN, N.K.

Spinal sensory component of the ganglia of the sympathetic nervous system. Biul. eksp. biol. i med. 49 no.1:122-125 Ja '60. (MIRA 13:7)

1. Iz kafedry gistologii i embriologii (zav. - chlen-korrespondent AN SSSR prof. G.K. Khrushchev, rukovoditel' raboty - prof. T.A.Grigor'yeva) II Moskovskogo meditsinskogo instituta (dir. - dotsent M.G.Sirotkina). Predstavlena deystv. chlenom AMN SSSR V.N.Chernigovskim.
(NERVES, SPINAL)

LANDSHMAN, N.K.

Spinal sensory component of vegetative ganglia. Biul.MOIP. Otd.biol. 65 no.3:149-150 My-Je '60. (MIRA 13:7)
(NERVOUS SYSTEM, SYMPATHETIC)

KHAMIDOV, D.Kh.; LANDSHMAN, N.K.; ZUFAROV, K.A.

Spinal sensory innervation of adrenal glands. Dokl. AN Uz.SSR 21 no. 11:67-69 '64. (MIRA 18:12)

1. Institut yadernoy fiziki AN UzSSR. Submitted Aug. 13, 1963.

LANDSKAYA, K.A., kand. tekhn. nauk; KULIKOVA, L.V., inzh.

High-boron chrome-nickel-tungsten-niobium steel ER4GO.
Teploenergetika 12 no.11:70-74 N '65. (MIRA 18:10)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii imeni I.P. Bardina.

107-57-2-11/56

AUTHOR: Popov, M. and Landsman, A., members of DOSAAF at "Serp i Molot" factory

TITLE: The Efforts of Active Workers. Let Us Create Amateur Radio Clubs (Silami aktiva. Sozdadim samodeyatel'nyye radiokluby)

PERIODICAL: Radio, 1957, Nr 2, p 13 (USSR)

ABSTRACT: Recently an amateur radio club was organized by a lower-level DOSAAF organization at the "Serp i Molot" factory, Kharkov. Leonid Osipovich Dubrovskiy, Chairman of the factory DOSAAF committee, delivered a report on the subject at the organizational meeting. Radio amateurs A. Sitchenko, V. Polevik, Landakov, Ledovskiy, Logvinenko, and others, seconded the motion to organize a new amateur radio club. After that, the motion was passed unanimously. The management of the plant, the Communist Party organization, and the trade union organization have helped to organize the new club. Rooms were allotted for radio operator classes and for a radio station. Over 3,000 rubles worth of tools and instruments were given to the organization. Military units associated with the "Serp i Molot" factory have given 10 RSI type and 1 A7A type radio stations for experimental work. Among the students of new radio classes are Nina Derevyanko, a member of the Komsomol and a turner in the automatic department, Yuriy Kolomiytsev, an electrician, Dmitriy Kochkarev, a milling machine operator, and many

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The Efforts of Active Workers (Cont.)

others who have never had previous contact with radio work. All club activities including the installation of equipment, classes, etc., take place after work in off-duty hours. Later a construction design group was singled out that included a design engineer Ledovskiy, an electrician Dogadin, a technician Zhuravlev, a test engineer Kort, and others.

AVAILABLE: Library of Congress

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LANDSMAN, A.P.

53-1a-8/18

AUTHOR VAVILOV, V.S., MALOVETSKAYA, V.M., GALKIN, G.N., LANDSMAN, A.P.

TITLE Silicon Solar Batteries as Sources of the Electric Feeding of Artificial Earth Satellites
(Kremniyevyye solnechnyye batarei kak istochniki elektricheskogo pitaniya iskusstvennykh sputnikov zemli. Russian)

PERIODICAL Uspekhi Fiz. Nauk, 1957, Vol 63, Nr 1a, pp 123 - 129 (U.S.S.R.)

ABSTRACT For artificial earth satellites it is of advantage to use solar batteries in connection with buffer accumulators because they are effective during the whole time of flight of the satellite (outside of the earth's shadow).

The principle of the effect of a semiconductor transformer with P-N-transitions. In the course of this process the energy of solar radiation is transformed into electric energy as follows: A photon is absorbed and an "electron-hole" pair is produced. In the case of lacking P-N-transition, however, the concentration of the electrons and holes in the semiconductor would increase in the vicinity of the absorption domain of light. The authors here investigated the diagram of the energy states of the electrons and holes in the semiconductor in the vicinity of the artificial produced P-N-transition. This diagram then supplies information concerning the mode of operation of the photoelement. Within the domain of the P-N-transition there exists a potential barrier,

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Silicon Solar Batteries as Sources of the Electric Feeding of Artificial Earth Satellites

53-1a-8/18

the height V_k of which can be nearly as great as the width E_g of the forbidden zone (in the case of silicon 1,1 eV). The electrons and holes produced on the occasion of the absorption of light diffuse to P-N--transition. The potential barrier of the P-N-transition then probably "separates" the electrons and holes so that the electrons advance freely to the domain of the electronic (N)-conduction of the crystal to which they then give a negative charge. On the occasion of transition into the domain of the hole-conditioned conduction line the holes charge the crystal positively. As a result of the change of the concentrations of the charge carrier the height of the potential barrier decreases. A diagram shows the dependence of the effective coefficient of a perfect semiconductor transformer with P-N-transition upon the width of the forbidden zone. The effective coefficient at first increases considerably, attains its maximum value at a width of 1,3 eV, and then gradually decreases again. In none of the known cases was the ideal effective useful coefficient of about 22 % attained. The authors developed a method for obtaining P-N-transitions in monocrystals of P-silicon by the thermal diffusion of phosphorus from the gaseous phase. Various details

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Silicon Solar Batteries as Sources of the Electric Feeding of Artificial Earth Satellites

of this method are discussed. The construction of an experimental silicon photoelement is shown in an illustration.

The Volt-ampère characteristics and the charge characteristics. The volt-ampère characteristic of a photoelement with a surface of 0,95 cm^2 irradiated by sunlight is shown in a diagram. For the darkness volt-ampère characteristic in the domain of the direct current a formula is written down. The optimum load resistance R_n can be determined from the load characteristic as well as by computation. The authors here point to the following means of further increasing the effective coefficient of transformation:

1.) Increase of the effective useful coefficient α to one,
2.) Decrease of the resistance $R_{ser} \ll R_n$ which is connected in series (?).
3.) Transillumination (making transparent ?) of the surface at $R = 0$.
4.) Improvement of the shape of the load characteristic by the application of material of a lower resistance (without changing α).

The evaluation of the fourth possibility requires further experimental investigations. The simultaneous increase from α up to a value near 1 as well as the reduction of the reflection and of R_{ser} to a minimum make it

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Silicon Solar Batteries as Sources of the Electric Feeding of Artificial Earth Satellites

possible to attain an effective useful coefficient of ~ 15 %.

The behavior of temperature in solar batteries. According to theory the electromotoric force developed by a silicon-photoelement must increase on the occasion of the reduction of temperature; a preliminary investigation resulted in $dV/dT = -0{,}00252$ V/°C. A diagram attached shows the dependence of V on temperature within the domain of from - 70 up to + 90°. If the solar battery is to yield the highest possible efficiency during the flight of the earth satellite, a sufficiently low equilibrium temperature of the solar battery is necessary. Possibilities for the decrease of equilibrium temperature are given. The experimental results for silicon solar batteries obtained at conditions prevailing on the earth confirm their applicability to earth satellits. (With 6 illustrations).

ASSOCIATION Not given
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Card 4/4

VAVILOV, V.S.; LANDSMAN, A.P.; SUBASHIYEV, V.K.

Solar batteries. Isk.sput.Zem. no.2:75-80 '58. (MIRA 12:5)

(Artificial satellites)
(Solar batteries)

82992
S/181/60/002/008/011/045
B006/B070

9.4160

AUTHORS: Gliberman, A. Ya., Zaytseva, A. K., Landsman, A. P.

TITLE: A Photoelectric Transformer From Polycrystalline Silicon

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 8, pp. 1751-1754

TEXT: For the preparation of photoelectric transformers, the cost of the initial material is an important consideration. Polycrystalline silicon costs only a fourth or fifth of what a single crystal does, but the former is not used because of its low efficiency (0.6%). The possibility of its application in a photoelement was recently investigated by the authors. They used polycrystalline p-type silicon whose structure is reproduced photographically. Phosphorous was thermally diffused in this silicon from the gaseous phase and thus a p-n junction was prepared. The transformers connected in series had resistances 1 - 2 ohms, those connected in parallel 1.5 - 10 kohms. Fig. 3 shows the load characteristic of three different transformers (whose parameters and method of preparation are given), and Fig. 4 the

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A Photoelectric Transformer From Polycrystalline Silicon

characteristics for different exposures of the sample No. 3. The maximum of the spectral sensitivity of the transformer lay in the region of 8000 - 8100 A and could, by special treatment, be shifted on either side by 500 A. The relative spectral sensitivities of the three samples investigated are shown in Fig. 5. The following results are obtained from the experiments: (1) Polycrystalline silicon can very well be used for making photoelectric transformers to convert solar energy into electrical energy. (2) The action of the crystalline points of contact, which is harmful for the transformer property, may be eliminated by applying a grid to the surface (Photo Fig. 2). (3) The maximum power of this transformer with solar radiation is on the average 5-6 mw/cm^2 of the effective surface. (4) The cost of a battery of 1 w power, made of polycrystalline silicon, is 1/2 to 1/3 of that which is made of single crystals. (5) The temperature and exposure dependence of the parameters of polycrystalline transformers are the same as for a single crystal one.

The authors thank N. S. Lidorenko for his interest and help, and V. K. Subashiyev, candidate of physical and mathematical sciences, for discussions. There are 5 figures and 3 references: 2 Soviet and 1 US.

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A Photoelectric Transformer From Polycrystalline Silicon

82992
S/181/60/002/008/011/045
B006/B070

SUBMITTED: April 4, 1959

IX

Card 3/3

24.7700 (1035, 1043, 1143)

S/181/60/002/011/007/042
B006/B056

AUTHORS: Subashiyev, V. K., Landsman, A. P., and Kukharskiy, A. A.

TITLE: Distribution of Phosphorus Atoms During the Diffusion in Silicon

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 11, pp. 2703 - 2709

TEXT: The authors describe investigations they carried out to determine the depth distribution of the concentration of phosphorus impurities in silicon by removing thin ($\sim\mu$) layers by etching (with a KOH solution) or grinding. Nine specimens were used for the purpose. In six cases, a comparison of experimental with theoretical results was found to be impossible, and in three cases the experimental results were so inaccurate that no unambiguous conclusions could be drawn from them. Extrapolation of the experimental data to zero thickness showed that n_o is always equal to $5 \cdot 10^{20}$ cm^{-3}. This value coincides with the solubility limit of phosphorus in silicon at 1250-1300°C (where diffusion took place). The three most characteristic cases of the depth distribution of concentration (as shown in Figs. 2-4) are investigated. From a theoretical point of view,

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86423

Distribution of Phosphorus Atc ..during the Diffusion in Silicon

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B006/B056

an anomalous course of the depth distribution curves is found, i.e., they are not linear and at greater depths the concentration decreases more rapidly than linearly. The curves fall well into the obtuse angle of two intersecting straight lines. The attempt is made to explain this anomaly by the following assumptions: 1) The original specimen was inhomogeneous. 2) There exists a reactive diffusion, i.e., the diffusion is accompanied by a reaction between P and Si, and a P-Si compound is formed. 3) The diffusion coefficient depends on the concentration of the diffusing phosphorus. This assumption is the least probable. The first two assumptions are briefly discussed. Summing up: 1) The distribution of the phosphorus concentration as a result of its diffusion in p-type silicon sheets was studied. 2) It was found that the concentration values calculated from data on the electrical conductivity and from the curve $n\mu = f(n)$ agree fairly well with the values resulting from measurements of electrical conductivity and Hall effect. This indicates that the concentration of compensated impurities is small compared to that of uncompensated impurities. 3) The carrier concentration distribution according to the depth does not follow the second Fick law. Indeed, the p-n junction, which is formed in the diffusion of phosphorus in p-type Si is only half

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Distribution of Phosphorus Atoms During the Diffusion in Silicon

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B006/B056

as deep as would follow from the Fick formula. 4) The phosphorus concentration in the surface layer (at a temperature of diffusion heating of 1200 - 1250°C) is approximately equal to the solubility limit of P in Si. There are 4 figures and 5 references: 3 Soviet, 1 US, and 1 German.

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors of the AS USSR, Leningrad)

SUBMITTED: May 16, 1960

Card 3/3

33950
S/665/61/000/003/014/018
E194/E420

26.1512

AUTHORS: Gliberman, A.Ya., Zaytseva, A.K., Landsman, A.P.

TITLE: An investigation of the possibility of using polycrystalline silicon for making photo-electric converters

SOURCE: Akademiya nauk SSSR. Energeticheskiy institut. Teploenergetika. no.3, 1961. Poluprovodnikovyye preobrazovateli solnechnoy energii. 116-128

TEXT: Hitherto, silicon photo cells have been made from single crystals but as these are expensive it would be advantageous to use polycrystalline silicon for this purpose. Published work on the subject is reviewed and seems to indicate that this is possible. The nature of polycrystalline silicon is discussed and also the nature of conduction, whether current flows through at the individual single crystals or round them through the impurities at their surfaces. The mobility of current carriers may be reduced by the intercrystalline layer and tests show that this mobility is indeed lower in polycrystals than in single crystals and this has limited the field of application of polycrystals. Polycrystalline

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An investigation of the possibility ...

silicon may be characterized by the type of conductivity (p or n), by the dimensions of the individual single crystals and by the method of production, depending on whether the crystal is grown with oriented seeding or not. If the seeding is oriented, the needles are larger and longer and tend to lie along the ingot, whereas if the seeding is not oriented, crystal growth is random. Individual crystals are of fairly constant resistance but the resistance of the grain borders is high. There are indications that contact resistance between grains is ohmic but that resistance jumps can result from the presence of impurities at the surfaces. The resistance characteristics of the components of the polycrystal are however yet inadequately understood. The influence of harmful effects at the boundaries of large grains can largely be overcome by appropriate construction of the semiconductor device, most of the pairs generated need not overcome the boundary layer before separation. Apparently, the boundary layer affects only pairs formed near to it. If the grains are much bigger than the diffusion length of the current carriers and in particular if they are greater than the thickness of the layer, the probability

An investigation of the possibility ...

of recombination on the boundaries is slight. The bad effect of high resistance of the intercrystalline layers can be overcome by using a grid type terminal construction so that the converter consists of a number of small elements in parallel, but the need even for this construction can be avoided by the deposition of a film of good conductivity. The presence of impurities in the intercrystalline region has a damaging effect on the converter and high concentrations of impurities can shunt the p-n transition. This has been observed in samples made from polycrystal ingots of low resistance. In general, the operating characteristics of polycrystalline converters differ little from those of photo-cells made from single crystals, however, the no-load voltage and short-circuit current density are lower so that the efficiency is lower. Performance data are given for photo-cells made with both orientated and unorientated polycrystals and in general the polycrystalline cells may be classified into two types. In one type there is an inflection point in curves of the natural logarithm of current as function of voltage in the voltage range of 250 to 450 mV. In the second type there is no such inflection

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E194/E420

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point. The changes in no-load voltage, short circuit current series resistance and maximum power with temperature of polycrystal converters are very similar to those of single crystals but sometimes, at low temperatures, the series resistance is very high, though this does not always cause a great reduction in the output. The reasons for this are discussed. The maximum spectral sensitivity of polycrystal photo-converters lies in the wavelength range 7500 to 8500 Å. The maximum output per unit surface of a typical polycrystalline converter exposed to sunlight is at present 5 to 6 mW/cm^2. The cost of a 1 W battery made of polycrystalline silica is a half to a third of the cost of a single crystal battery. Despite the inferior power characteristics polycrystalline silicon photo cells may prove to be promising material for the mass production of photo-electric converters. There are 11 figures, 2 tables and 9 references: 8 Soviet-bloc and 1 non-Soviet-bloc. The reference to an English language publication reads as follows: Ref.6: Prince M. J. Appl. Phys., 26 (5), 1955, 534.

Card 4/4

35604
S/166/62/000/001/006/009
B125/B104

26.1512

AUTHORS: Daletskiy, G. S., Knigin, P. I., Landsman, A. P., Plyushch, O. P., Shavrin, N. V., Yagudayev, M. D.

TITLE: Effect of solar energy concentration upon the operational properties of (silicon) solar photopiles

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 1, 1962, 49-52

TEXT: A joint investigation with the VNIIT was conducted by the authors in Tashkent from April to June, 1961 on the output power of silicon photoconverters of luminous flux. The aim is to collect data for the construction of a solar power station. The Sun's light was concentrated through an ordinary parabolic cylindrical mirror onto the 288-cm^2 water-cooled silicon photopile constructed at the above Institute. The angle of incidence of the Sun's rays was of no practical significance for the present purpose. The maximum yield function of the piles rose, although somewhat more slowly, even at photocurrents of 6600-7700 watts/m^2, at surface temperatures from 10°C to 70°C and air temperatures from 8 to 15°C (i.e.,

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under practical operational conditions). This also holds in the case of considerable temperature differences between the pile and the surrounding medium. It probably takes higher luminous fluxes for saturation to be brought about. The maximum output power was 4-4.2 watts. At an increase of the luminous flux from 0 to 7000 kcal/m·hour, the pile emf rose by only 5-6%. Since pile heating by luminous flux produces a linear power reduction, it is necessary to develop efficient cooling systems. The reciprocal exchange of photoconverters in the pile would also serve to check this power drop. Since the temperature difference between pile and air can attain rather high values in the extremely hot summers of Soviet Central Asia, the power drop can be considerable. The yield function of solar power stations could be augmented to the eight to tenfold by improving the cooling system, by providing uniform illumination all over the pile surface, and by ensuring optimum commutation conditions. There are 6 figures and 1 Soviet reference.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Physicotechnical Institute of the AS Uzbekskaya SSR). Vsesoyuznyy n.-i. institut istochnikov toka (All-Union Scientific Research Institute of Current Sources)

SUBMITTED: August 4, 1961

GOLOVIN, B.M.; LANDSMAN, A.P.; GRIGOR'YEVA, G.M.; OSIPENKO, V.P.; SARANTSEVA, V.R., tekhn. red.

[Effects of high-energy protons on silicon phototubes] Deistvie protonov vysokoi energii na kremnievye fotoelementy. Dubna, Ob"edinennyi in-t iadernykh issledovanii, 1963. 26 p. (MIRA 16:6)

(Protons) (Photoelectric cells)

GOLOVIN, B.M.; GRIGOR'YEVA, G.M.; LANDSMAN, A.P.; OSIPENKO, B.P.

Effect of high-energy protons on silicon photocells. Kosm. issl. 1 no.2:271-286 S-O '63. (MIRA 17:4)

L 8948-65 EWT(l)/EWT(m)/EWG(v)/EEC-4/FCC/EEC-4/EEC(t)/T/EWA(h) Po-4/Pe-5/Pq-4/
Pae-2/Peb/Pi-4 IJP(c)/SSD/AFWL GW/WS

ACCESSION NR: AP4043500 S/0293/64/002/004/0623/0627

AUTHOR: Bry*kina, L. S.; Golovin, B. M.; Landsman, A. P.; Osipenko, B. P.; Fedoseyeva, O. P.

TITLE: Effect of high energy protons on nuclear-radiation semiconductor detectors

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 4, 1964, 623-627

TOPIC TAGS: high energy proton, surface barrier transistor, nuclear radiation detector, proton bombardment, irradiation dose, silicon nuclear radiation detector

ABSTRACT: A study of the effect of high-energy protons on surface-barrier nuclear-radiation detectors made of n-type silicon has been conducted. Preliminary data on changes in some characteristic features of these detectors during bombardment with protons having an energy of about 650 Mev are given. The samples of surface-barrier detectors had a specific resistance of 200—300 ohm·cm and a resolution of 1—3% during registration of α-particles with energies of

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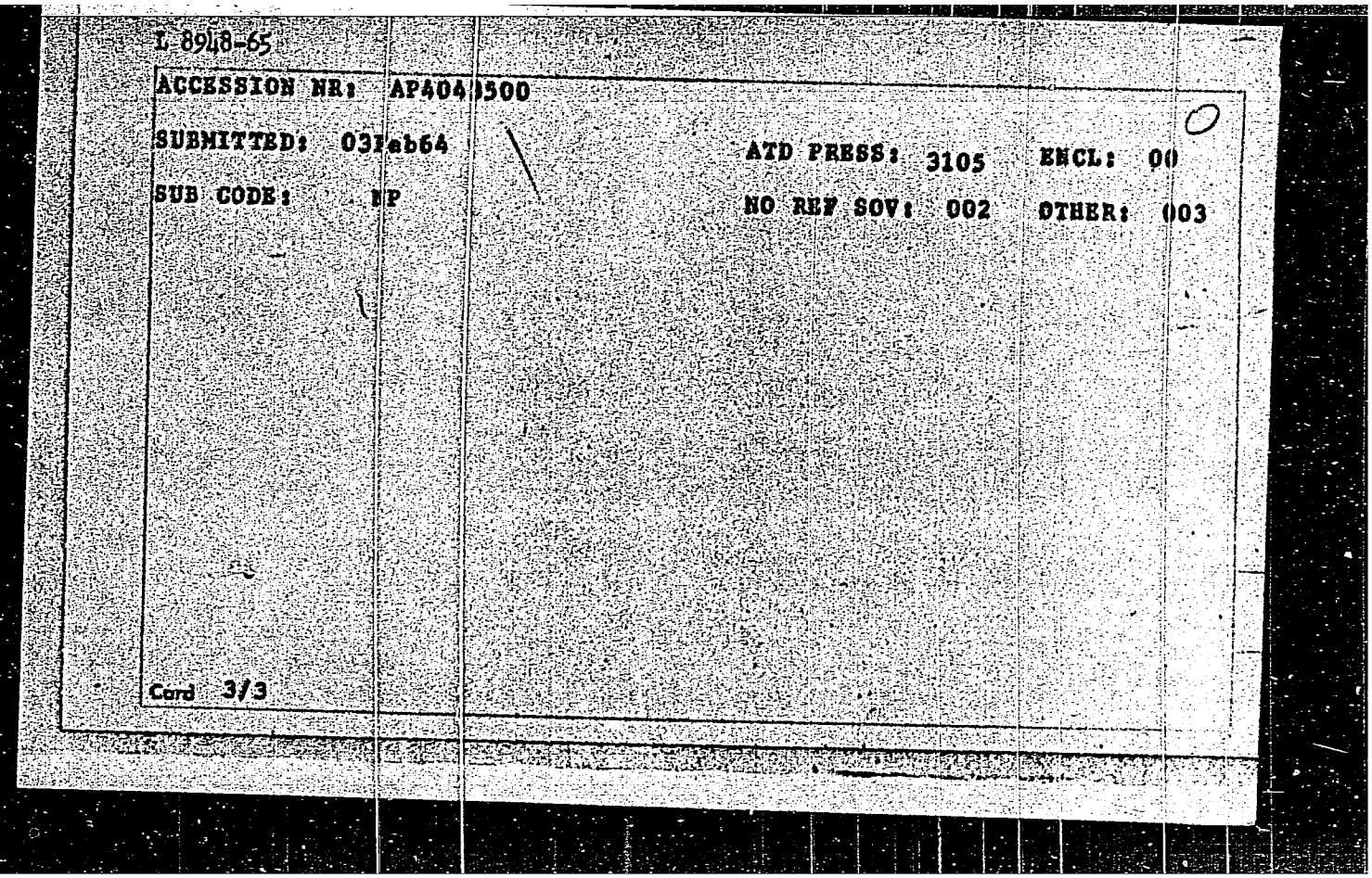
L 8948-65
ACCESSION NR: AP4043500

4.8 Mev. The relationships between pulse amplitude, signal-to-noise ratio, capacity, energy resolution, and the irradiation dose received by the detector were studied during the experiments. Fourteen samples were irradiated. The measurements proved that proton-beam densities varied from 1.7×10^8 to 6×10^{13} proton/cm^2 and that the maximum irradiation dose was approximately 2×10^{14} proton/cm^2. It can be concluded from the data obtained that in detectors whose surfaces were electrochemically and chemically polished, no noticeable change in radiation-damage stability occurs and that detector parameters vary only slightly at doses up to 5×10^{11}-10^{12} proton/cm^2. If the doses exceed this value, the detector characteristics change considerably faster with the increase of dose. The lifetime of surface-barrier silicon detectors for operation in Earth's radiation belts was theoretically estimated by means of a model. Orig. art. has: 7 figures and 3 formulas.

ASSOCIATION: none

Card 2/3



L 8948-65

ACCESSION NR: AP4041500

SUBMITTED: 03Feb64 ATD PRESS: 3105 ENCL: 00

SUB CODE: NP NO REF SOV: 002 OTHER: 003

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L 17698-65 EEO-2/EWG(j)/FSF(h)/FSS-2/EWG(r)/EWT(l)/EEC(m)/EWT(m)/FS(v)-3/EEC(k)-2/
EWG(v)/EWP(t)/EWG(a)/EED-2/EWG(c)/EWP(b) Pe-5/Pg-4/Pi-4/Pl-4/Po-4/Pq-4/Pao-4/
Pae-2 IJP(c) TT/JD/GW

ACCESSION NR: AP4043501 S/0293/64/002/004/0628/0632

AUTHOR: Koltun, M. M.; Landsman, A. P.

TITLE: Transillumination and temperature stabilization of silicon photocells designed for operation under conditions of radiation heat exchange

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 4, 1964, 628-632

TOPIC TAGS: silicon photocell, radiation heat exchange, space station operation, temperature regulation coating, photocell spectral sensitivity, cerium dioxide, zinc sulphide

ABSTRACT: A two-layer coating is described which permits a combination of efficient transillumination with considerably improved receiving surfaces of silicon photocells. In developing the photocell coating it was necessary to combine good radiating characteristics with high transilluminating qualities because, owing to a comparatively high index of silicon refraction, the reflection factor reaches 34—35% in the spectral sensitivity region of the photocell

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L 17698-65

ACCESSION NR: AP4041501

(0.4—1.1μ), which, in turn, results in a corresponding drop in efficiency. A study was made of the possibility of reducing the reflection at the boundary of the silicon and the heat-regulation coating (N_{Si} and N_{hrc}) between them by the introduction of a transilluminating layer with an intermediate refraction index. It was found that to achieve the maximum reduction of the reflection from the said boundary (at N_{hrc} = 1.5 in the region 0.4—1.1 μ), the refraction index of the intermediate layer should be 2.47 at 0.6 μ and 2.34 at 0.8 μ. The coating was made from CeO_2 and ZnS films having a refraction index close to the above figures. In the experiments, an increase in short-circuit currents and a 40—42% increase in the efficiency of the photocells were obtained along with a decrease of a_c/ε to 0.94—0.98 (where a_c is the integral coefficient of solar radiation absorption, and ε is the integral coefficient of the natural radiation of the photogenerator receiving surface). Therefore, the temperature of the photocells can be considered to be stabilized during their operation aboard space stations at 44—45C. Protection of the transilluminating layer against an ambient atmosphere effect and the absence of additional heat from the so-called "hothouse" ef-

Card 2/3

L 17698-65

ACCESSION NR: AP4043501

fect are the assets of the two-layer coating described. Orig. art. has: 3 figures.

ASSOCIATION: none

SUBMITTED: 12Feb64 ENCL: 00

SUB CODE: OP, EC NO REF SOV: 002 OTHER: 003

Card 3/3

L 8640-65 EWT(m)/EWP(b) AFETR/ESD(ga)/AFWL/SSD/ASD(a)-5/RAEM(t) JD/JG

ACCESSION NR: AP4044941 S/0181/64/006/009/2700/2702

AUTHOR: Kagan, M. B.; Landsman, A. P.; Chernov, Ya. I.

TITLE: Some photoelectric properties of p-n junctions in the GaP-GaAs system

SOURCE: Fizika tverdogo tela, v. 6, no. 9. 1964, 2700-2702

TOPIC TAGS: photocell, solar battery, gallium arsenide phosphide, carrier mobility, sensitivity increase, forbidden band

ABSTRACT: The purpose of the research was to increase the sensitivity of photocells for the conversion of solar energy into electricity. The photoelectric properties studied were the spectral distribution of the short-circuit photocurrent and the temperature dependences of the short-circuit photocurrent and of the no-load voltage (see Enclosure). The tests were made in the interval 0.40—0.95 μ and the tested photocell was prepared by producing a layer of GaP on the surface of a GaAs plate by diffusion annealing in phosphorus vapor, followed by production of a p-n junction with subsequent diffusion of

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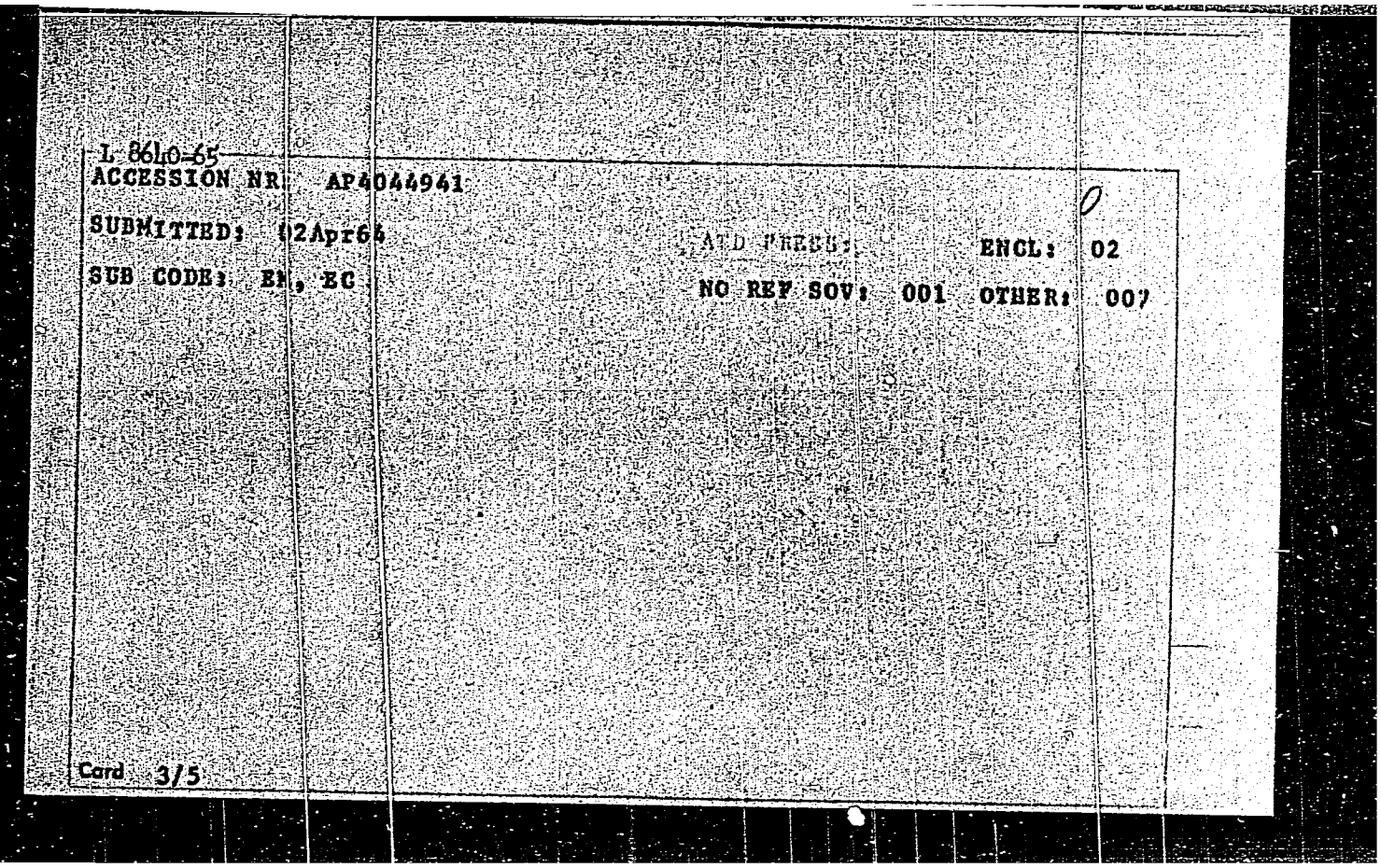
L 8610-65

ACCESSION NR: AP4044941

zinc. The initial material was a GaAs single crystal with electron density (2—4) x 10^{17} cm^{-3} and mobility ~3000 $cm^2/v\text{-}sec$. The results have shown that a system constituting a surface layer of GaP, a thin region with variable width of the forbidden band, and a basic layer of GaAs, has a greater sensitivity in the short-wave portion of the spectrum than Si or GaAs p-n junctions. The tests have also shown that the spectral sensitivity can be varied by varying the depth of the p-n junction. The thickness of the GaP layer together with the region of variable composition, in which the width of the forbidden band varied at room temperature from E_1 = 2.25 ev (GaP) to E_2 = 1.35 ev (GaS), was 5—7 microns. The advantages of the described photocells are due to the variable-composition region and to the fact that one of the active regions of the p-n junction (GaP) is a semiconductor with a broad forbidden band. Orig. art. has: 2 figures.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut istochnikov toka, Moscow (All-Union Scientific Research Institute of Current Sources)

Card 2/5



L 8640-65
ACCESSION NR: AP4044941

SUBMITTED: 12Apr64 ATD PRESS: ENCL: 02

SUB CODE: EM, EC NO REF SOV: 001 OTHER: 007

Card 3/5

L 8640-65
ACCESSION NR: AP4044941

ENCLOSURE: 01

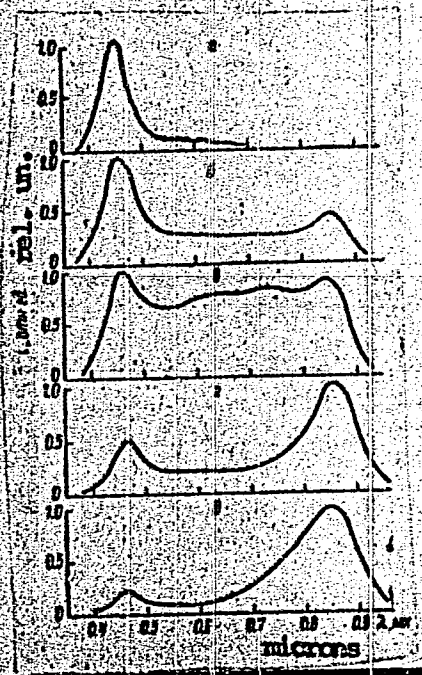


Fig. 1. Spectral distribution of short-circuit photocurrent for photocells with different depth of the p-n junction

Curves a - e correspond to a successive displacement of the p-n junction from the GaP region toward the GaAs region.

Card 4/5

L 8640-65
ACCESSION NR: AP4044941

ENCLOSURE: 02

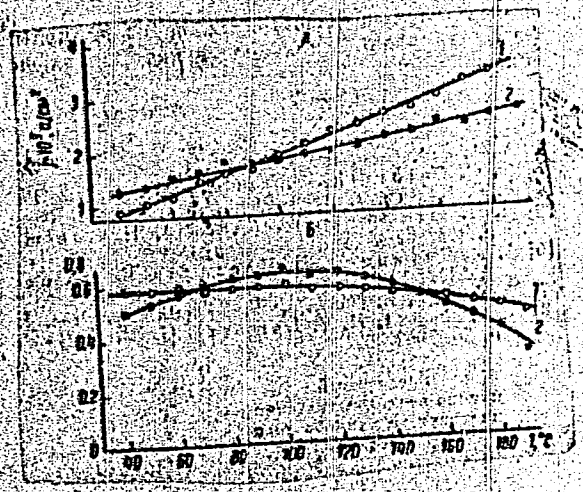


Fig. 2. Temperature dependence of short-circuit photocurrent and of open-circuit voltage (A and B, respectively) for photocells 1 and 2

Source power - 80 mw/cm^2.

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L 31041-65 EWT(l)/EEC(t)/EWA(h) Pz-6/Pab IJP(c) AT

ACCESSION NR: AP5002909 S/0109/65/010/001/0138/0146

AUTHOR: Buzanova, I. K.; Vasil'yev, A. M.; Gliberman, A. Ya.; Landsman, A. P.

TITLE: Photocells with longitudinal photoelectric effect

SOURCE: Radiotekhnika i elektronika, v. 10, no. 1, 1965, 138-146

TOPIC TAGS: photocell, photoelectric effect

ABSTRACT: The equation for potential difference across an infinite p-n junction set up by G. Lucovsky (J. Appl. Phys., 1960, 31, 6, 1088) is adapted, in the present article, to the case of a finite-size photocell. Boundary conditions for solving the problem are formulated with an allowance for that part of the p-n junction which is located under the contact. For not very high light intensities, the solution is presented as a small-parameter series. At variance with Lucovsky's assumptions, the longitudinal photo-emf is supposed to be small as

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L 31041-65

ACCESSION NR: AP5002909

compared with AkT/q = 30—50 mv, where A is the parameter of the current-voltage p-n-junction characteristic, k is the Boltzmann constant, T is temperature, and q is the electron charge. An equivalent circuit of the photocell is suggested, and conditions of independence between photo-emf's of both pairs of contacts are formulated. Experimental results are reported which were obtained with phosphorus-doped high-resistivity Si 5x6-mm and 10x12-mm cells illuminated by a 0.4-mm light spot. The reduced longitudinal sensitivity was 60—80 mv/mm-mw; reverse saturation current, 10^{-8} a/cm^2. The effect of the light spot position on the longitudinal photo-emf and photo-current is presented in 6 curves. Orig. art. has: 5 figures and 30 formulas.

ASSOCIATION: none

SUBMITTED: 27Sep63 ENCL: 00 SUB CODE: EM

NO REF SOV: 002 OTHER: 004

Card 2/2

L 52747-65 FSS-2/EWT(1)/EPA(s)-2/EPF(c)/EEC(k)-2/EWG(m)/EPA(w)-2/T/EPA(bb)-2/EWA(h)
Pz-6/Pr-4/Pt-7/Peb UR/0377/65/000/001/0016/0021
ACCESSION NR: AP5012024 IJP(c) JHB/TT/WW/GG/AT

AUTHOR: Landsman, A. P.; Yagudayev, M. D. (Deceased); Shavrin, N. V.; Yusbov, Yu. M.

TITLE: Power station for the conversion of solar energy into electricity

SOURCE: Geliotekhnika, no. 1, 1965, 16-21

TOPIC TAGS: photovoltaic energy conversion, solar cell, electric power station, silicon

ABSTRACT: The article describes an experimental photovoltaic solar energy converter which was constructed in 1962 in Uzbekistan. The 150-w photobattery has a working surface of 0.4 m^2 and consists of 3384 silicon photoelements (15 x 15 mm each) arranged in six sections and cooled by water flowing at a rate of 400 liters per hour. The distinctive feature of the converter is its centrally located light collector, onto which solar rays are reflected by 108 flat mirrors arranged at varying angles on either side of the photoelectric panel. The open-circuit voltage of the photobattery is 160 v, the short-circuit current 230 mamp, and the efficiency 6.7%. The converter has been used successfully to run two motors capable of lifting about 4000 liters of water per hour to a height of 6 m. The article contains a brief review of 15 recent papers (1 Western and 14 Soviet) on developments in photovoltaic solar energy conversion for various applications. The following points are empha-

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L 52747-65

ACCESSION NR: AP5012024

sized: 1) at solar light fluxes of up to 5 kw/m^2 the output power increases linearly; 2) at light fluxes up to 11 kw/m^2 no saturation is attained, even though the rate of output increase is reduced; 3) collectors must distribute light evenly over the photosensitive surface; 4) the photobattery must be provided with an efficient heat removal system; and 5) a mechanism for automatically orienting the installation toward the sun is necessary. It is concluded that, because of the high cost of silicon (which is still considered the most effective material), photovoltaic converters cannot at present compete economically with other means of energy production. Orig. art. has: 8 figures. [ZL]

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Physicotechnical Institute AN UzSSR)

SUBMITTED: 01Nov64

ENCL: 00

SUB CODE: EE

NO REF SOV: 014

OTHER: 001

ATD PRESS: 4013

Card 2/2

L 62244-65 EWI(l)/EWI(m)/EPF(c)/EPF(n)-2/EWG(m)/EWP(t)/EWP(b) IJP(c) JD/WW/GS

ACCESSION NR: AT5015789 UR/0000/65/000/000/0029/0033 22 21 B7+1

AUTHOR: Koltun, M. M.; Landsman, A. P.

TITLE: Thermal balance of silicon photocells operating under radiation heat-exchange conditions

SOURCE: AN SSSR. Energeticheskiy institut. Ispol'zovaniye solnechnoy energii v narodnom khozyaystve SSSR (Use of solar energy in the economy of the U.S.S.R.). Moscow, Izd-vo Nauka, 1965, 29-33

TOPIC TAGS: silicon photocell

ABSTRACT: The possibilities of improving the thermal balance of silicon photocells by altering the optical characteristics of their working surfaces are theoretically and experimentally explored. Special treatments of the working surfaces were intended to reduce the working temperature of solar-illuminated silicon photocells. Two methods of surface treatment were used: (1) The anode

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L 62244-65

ACCESSION NR: AT5015789

etching by a 5%-solution of HF after D. R. Turner (J. Electrochem. Soc., 1958, no. 7), and (2) The chemical etching in HF mixed with HNO_3 which resulted in coating the surface with a gray SiO_2 film. It was found that: (1) The electrochemical treatment practically does not protect the photocell from radiational overheating (the reflectance of the surface within 3—30μ practically did not change); (2) The chemical treatment holds the reflectance under 8—10% within 3—30μ which testifies to a high absorption and 0.9—0.92 radiation. "The authors wish to thank L. D. Kislovskiy for his advice and assistance in the optical measurements." Orig. art. has: 2 figures and 3 formulas.

ASSOCIATION: none

SUBMITTED: 12Feb65 ENCL: 00 SUB CODE: EM,TD

NO REF SOV: 003 OTHER: 004

Card 2/2 dlp

L 57453-65 EWT(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/JG/GS
ACCESSION NR: AT5015792 UR/0000/65/000/000/0049/0052

35
B+1

AUTHOR: Kagan, M. B.; Landsman, A. P.

TITLE: GaAs photocells

SOURCE: AN SSSR. Energeticheskiy institut. Ispol'zovaniye solnechnoy energii v narodnom khozyaystve SSSR (Use of solar energy in the economy of the USSR). Moscow, Izd-vo Nauka, 1965, 49-52

TOPIC TAGS: photocell, gallium arsenide photocell, silicon photocell, semiconductor photocell

ABSTRACT: The electrical, spectral, and temperature characteristics of GaAs photocells were studied. N-type GaAs single crystals (electron concentration, 1×10^{17} /cm^3; electron mobility, 2000—3000 cm^2/v sec) were cut into wafers 0.8—1 mm thick. The p-n junction was produced by controlled thermal diffusion of Zn or Cd acceptor impurities. Nickel served as the contact with n-type GaAs, and contact with the diffusion layer was obtained by a conducting compound deposited on an aluminum strip. Comparison of the volt-ampere characteristics of specimens illuminated with artificial light and with normal solar radiation of 870 w/m^2 showed that short-circuit current values of the latter averaged 10% higher. The best of the investigated

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L 57453-65
ACCESSION NR: AT5015712

GaAs photocells, with a useful working area of 0.25 cm^2, developed a maximum power of 9.5 mw/cm^2 for an efficiency of 11%. Short-circuit-current density was 13 to 17 $mamp/cm^2$ and no-load voltage, about 0.9 v. The emf values of the GaAs photocells were about 1.5 times higher than those of Si photocells, which indicates better utilization of the forbidden zone potential for GaAs. The spectral sensitivity of the specimens was measured in the 400—1100-mμ range with a ZMR-3 monochromotor. In all cases, a sharp increase in spectral sensitivity occurred in the 800-mμ region, and there was a sharp drop in sensitivity in the shortwave region of the spectrum. Measurements of temperature characteristics demonstrated the following: 1) At 200C, the emf of GaAs photocells was equal to that of Si photocells at room temperature; 2) at 200C, the efficiency of GaAs photocells was one order higher than that of Si photocells; 3) at room temperature, GaAs and Si photocell efficiency was equal; 4) the magnitude of short-circuit current varied little in the temperature range studied (20—200C). Orig. art. has: 3 figures and 2 tables. [DW]

ASSOCIATION: none

SUBMITTED: 12Feb65 ENCL: 00 SUB CODE: EM, SS

NO REF SOV: 001 OTHER: 001 ATD PRESS: 4044

Card 2/2

LANDSMAN, A.P.; YAGUDAYEV, M.D. [deceased]; SHAVRIN, N.V.; YUABOV, Yu.M.

Power plant for converting solar energy into electricity. Gelio-tekhnika no.1:16-21 '65. (MIRA 18:5)

1. Fiziko-tekhnicheskiy institut AN UzSSR.

L 60976-65 EWA(h)/EWT(l)/EWT(m)/EWP(b)/T/EWP(t) Pz-6/Peb IJP(c)
AT/JD/JG UR/0120/65/000/003/0232/0233
ACCESSION NR: AP5016404 621.383.5

AUTHOR: Kagan, M.B.; Landsman, A.P.; Chernov, Ya.I.

TITLE: Photoelement with extended spectral sensitivity

SOURCE: Pribory i tekhnika eksperimenta, no. 3, 1965, 232-233

TOPIC TAGS: photoelement, spectral sensitivity, semiconductor, gallium phosphide, gallium arsenide, p n junction

ABSTRACT: The feasibility of a spectral sensitivity correction in photoelements operating in the 0.45-0.85 μ range without the use of photofilters or reductions in spectral sensitivity was discussed earlier by E.D. Jackson (Trans. Conf. on the Use Solar En., 1955, 5, 126) and T. Wolf (Proc. IRE, 1960, 48, 1246). The method is based on p-n junction semiconductor photoelements which contain variable-width forbidden bands. The present article reports on such a GaP-GaAs system (electron concentration 1-5·10^17 cm^-3, electron mobility 3000 cm^2/sec at room temperature) within which, during the diffusion of P from the vapor phase, there appears a surface layer of gallium phosphide together with a thin GaP to GaAs transition region corresponding to a forbidden zone width change from 2.25 to 1.35 eV (at room temperature). The total thickness of the superposed layers is 5-7 μ. The electron-

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L 60976-65
ACCESSION NR: AP5014404

hole transitions are produced by subsequent Zn diffusion (see, e.g., D.N. Nasledov, B.V. Tsarenkov, Fiz. tv. tela, 1959, sb. 1, 9, 1467). The spectral sensitivity of the element is shown in Fig. 1 of the Enclosure. Load characteristics are also given. Orig. art. has: 2 figures.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut istochnikov toka, Moscow (All-Union Scientific Research Institute for Current Sources)

SUBMITTED: 30Mar64 ENCL: 01 SUB CODE: EC

NO REF SOV: 002 OTHER: 002

Card 2/3

L 60976-65
ACCESSION NR: AP5016404

ENCLOSURE: 01

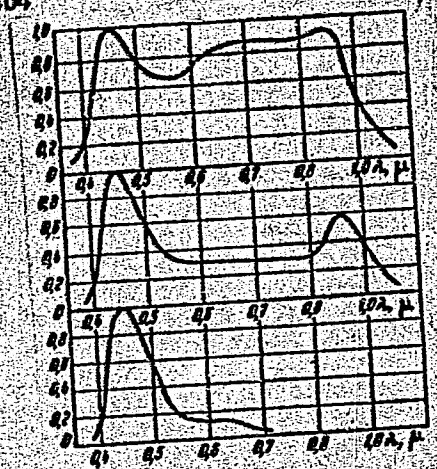

Figure 1. Spectral sensitivity of photoelements with various depths of p-n transition site: a - transition near the surface of the GaP layer; b, c - transition within the GaP-GaAs transition layer.

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L 63564-65 EWT(l)/EWT(m)/EWG(v)/EEC-4/EEC(t)/EWA(h)/FCC/EPF(c)/EPR/Pe-5/Pq-4/Pae-2/
Pab/P1-4/Pod GW

ACCESSION NR: AP5015681 UR/0293/65/003/003/0499/0502
621.376.234:539.12

AUTHOR: Brykina, L. S.; Vasilev, V. S.; Golovin, B. M.; Landsman, A. P.; Osipenko, B. P.; Fedoseyeva, G. P. 19

TITLE: The effect of high-energy protons on semiconductor detectors of nuclear radiation. II. Diffusion-drift detectors

SOURCE: Kosmicheskiye issledovaniya, v. 3, no. 3, 1965, 499-502

TOPIC TAGS: semiconductor detector, nuclear radiation, diffusion drift detector, silicon N I P detector, proton bombardment

ABSTRACT: Eighteen silicon N-I-P detectors with 0.3-mm sensitive films and four with 2-mm layers were subjected to proton bombardment of 2×10^9—8×10^9 proton/cm^2-sec with a maximum dose of 5×10^{13} proton/cm^2. With the 0.3-mm type, investigation was made of detector output pulse height, reverse current, energy resolution, and detector capacitance as a function of the radiation dose. The results show that the immunity of the diffusion-drift detectors is approximately equal to that of the surface-barrier type; i.e., no substantial deterioration of parameters was observed for doses as high as 10^{12} proton/cm^2. With the 2-mm type, the changes in

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L 63564-65

ACCESSION NR: AP5015681

the electrical structure were determined by measuring the detector photoresponse before and after bombardment. It was found that after a dose of 8×10^{12} proton/cm^2 the sensitive area of the detector was reduced, becoming practically negligible after a dose of 5×10^{13} proton/cm^2. Orig. art. has: 4 figures. [BD]

ASSOCIATION: none

SUBMITTED: 16Dec64 ENCL: 00 SUB CODE: NP, EC

NO REF SOV: 003 OTHER: 000 ATD PRESS: 4020

Card 2/2

L 49802-65 EWT(l)/EWT(m)/T/EWP(t)/EWP(b)/EWA(h) Pz-6/Peb IJP(c)
JD/AT

ACCESSION NR: AP5010106 UR/0109/65/010/004/0727/0735 37 36 B

AUTHOR: Bordina, N. M.; Vasil'yev, A. M.; Zaytseva, A. K.; Landsman, A. P. 27

TITLE: Effect of the spreading resistance on the load characteristic of a silicon photocell having various takeoff contacts

SOURCE: Radiotekhnika i elektronika, v. 10, no. 4, 1965, 727-735

TOPIC TAGS: semiconductor, photocell, silicon photocell, spreading resistance

ABSTRACT: As in practical silicon photocells, the reduction of the output voltage (20—30 mv) due to the spreading resistance is small compared to the parameter AkT / q = 40 mv (where k is the Boltzmann constant, T is the temperature, q is the electron charge, and A is a numerical constant about 2), the photocell load characteristic is presented as a small-parameter series; the ratio of the voltage drop in the doped layer to AkT / q is used as the small parameter. Equations and

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L 49802-65
ACCESSION NR: AP5010106

boundary conditions are supplied which permit determining the consecutive terms of this series. Using a simplest photocell as an example, it is shown that, in the first approximation, the M. B. Prince equivalent circuit (J. Appl. Phys., 1955, 26, 5, 534) is valid. Formulas are also derived for a contact arranged along the perimeter of the doped layer, along 3 sides, 2 sides, grill-shaped and grid-shaped contacts. A 30x15 rectangular silicon photocell illuminated by a ZS-3 lamp having a luminous flux of 800 w/m² served for measuring the load (current-voltage) curve. A theoretical curve plotted in the same figure shows good agreement. Orig. art. has: 7 figures and 40 formulas.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut istochnikov toka (All-Union Scientific Research Power Source Institute)

SUBMITTED: 07Dec63 ENCL: 00 SUB CODE: EC

NO REF SOV: 001 OTHER: 003

Card 2/2

L 21288-66 FSS-2/EWT(l)/EWT(m)/EEC(k)-2/EWG(m)/T-2/EWP(t) IJP(c) JD/TT/WW/RM/GS/AT

ACC NR: AP6007743 SOURCE CODE: UR/0293/66/004/001/0128/0136

AUTHOR: Kagan, M. B.; Landsman, A. P.; Chernov, Ya. I.

61
60
B

ORG: none

TITLE: Analysis of spectral and thermal characteristics of photoelectric converters and the selection of effective areas of their application

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 1, 1966, 128-136

TOPIC TAGS: solar cell, photoelectric cell, gallium arsenide, silicon

ABSTRACT: The spectral and thermal characteristics of GaAs and GaAs—GaP energy converters were studied and compared with those made of Si in order to determine the most advantageous fields of application of the respective materials as photovoltaic sources of space power. The fabrication procedures and the basic parameters of the samples used in the experiments were described in earlier papers (Gutkin, A. A., D. N. Nasledov, V. Ye. Sedov, and B. V. Tsarenkov, FTT, 4, 9, 1962, 2338; Kagan, M. B., and A. P. Landsman, Ispol'zovaniye solnechnoy energii v narodnom khozyaystve, Izd-vo "Nauka," 965, p. 53; Kagan, M. B., A. P. Landsman, and Ya. I. Chernov, FTT, 6, 9, 1964, 2700). The effective area of the investigated GaAs cells was 1—1.5 cm^2,

Card 1/2 UDC: 621.383.5

L 21288-66
ACC NR: AP6007743

and their efficiency at 20C was 7—9%; the efficiency of the variable-gap GaAs—GaP cells reached 6—7% at 200C. The measurements showed that while Si solar cells still appear to be the most suitable for the temperature range of +20—+80C and at normal solar illumination, at higher temperatures GaAs offers several advantages. The authors recommend the use of GaAs in the temperature range of +80—180C and in conjunction with solar concentrators. According to their calculations, a solar flux concentration by a factor of 4—6 can be achieved without the use of a cooling system. Variable-gap GaAs—GaP solar cells are recommended for use at temperatures above +200C. These cells are said to be able to withstand a solar flux concentration by a factor of 10—20 without the necessity of cooling. Orig. art. has: 6 figures, 2 tables, and 2 formulas.

[ZL]

SUB CODE: 10/ SUBM DATE: 29Dec64/ ORIG REF: 007/ OTH REF: 011
ATD PRESS: 4214

Card 2/2 dda

L 24856-66 EWT(1)/T IJP(c) AT

ACC NR: AP6009439 (A) SOURCE CODE: UR/0377/65/000/003/0005/0009

AUTHORS: Lidorenko, N. S. (Doctor of technical sciences); Nabiullin, F. Kh.; Tarnizhevskiy, B. V.; Gertsik, Ye. M.; Shul'meyster, L. F.; Landsman, A. P. (Candidate of technical sciences)

ORG: All-Union Order of the Red Banner of Labor Scientific Research Institute of Current Sources (Vsesoyuznyy ordena Trudovogo Krasnogo Znameni n.-i. institut istochnikov toka)

TITLE: An experimental solar electric power station

SOURCE: Geliotekhnika, no. 3, 1965, 5-9

TOPIC TAGS: solar energy conversion, solar power plant, solar battery, agricultural machinery, volt ampere characteristic, solar radiation, water supply system

ABSTRACT: This paper presents an experimental solar electric power station for driving water-raising equipment in pasture grounds in southern regions. The solar battery is in the form of strips which are directly illuminated; the battery receives additional illumination from inclined side mirrors (see Fig. 1). The apparatus was tested under field conditions in 1964. The optimum power is 248 W

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at a voltage of 45 V for the solar battery (see Fig. 2).

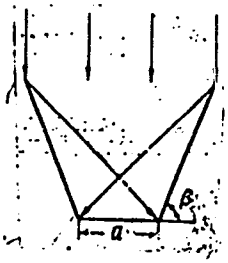

Fig. 1. Diagram of concentrating system: a--width of solar battery; β--angle of inclination of mirror.

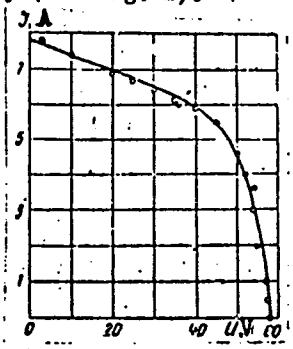

Fig. 2. Volt-ampere characteristic of solar battery of solar apparatus for nominal radiation (800 W/m^2).

The efficiency of the battery was found to be 3.5%, of the apparatus 2.6%. The apparatus was found to be technically advantageous and promising for the purpose of water raising. Orig. art. has: 4 formulas, 2 diagrams, 1 photograph, and 2 graphs.

SUB CODE: 02, 10/; SUBM DATE: 30May65/ ORIG REF: 005

Card 2/2 dda

L 34819-66 EWT(l)/EWT(m)/T/EWP(t)/ETI IJP(c) JD/AT

ACC NR: AP6018530 SOURCE CODE: UR/0181/66/008/006/1708/1712

AUTHOR: Gusev, V. M.; Zadde, V. V.; Landsman, A. P.; Titov, V. V.

ORG: none

TITLE: Investigation of certain characteristics of photoconverters with p-n junctions produced by ion bombardment

SOURCE: Fizika tverdogo tela, v. 8, no. 6, 1966, 1708-1712

TOPIC TAGS: photoconductive cell, pn junction, silicon, ion bombardment, volt ampere characteristic, spectral energy distribution

ABSTRACT: This is a continuation of earlier work by the authors (FTT v. 7, 2077, 1965), where a procedure was developed of producing silicon photoconverters by producing inside the silicon a p-n junction resulting from bombarding silicon with 30-kev phosphorus ions. The present paper describes the results of further studies of the characteristics of such converters. The experiments were carried out with p-type silicon of resistivity 4 ohm-cm and initial minority carrier lifetime 10 — 50 μsec, using the same apparatus as before. The irradiation dose ranged from 1 to 10^5 μCoul/cm^2, and the current density from 1 to 100 μa/cm^2. The bombarding phosphorus ion energy was ~30 kev. It was found that the minimum dose required for the formation of the p-n junction was about 10^2 μCoul/cm^2. Annealing the crystal (at 500 and 600C) after bombardment makes it possible to produce the junction with smaller dose (but still above the threshold). The depth of the junction ranges from 0.75 to 1.1 μ

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ACC NR: AP6018530

4

which is 15 — 20 times farther than the depth of penetration of the bombarding phosphorus ions. Photoconverters of this type have an efficiency of 6 — 8%, with a maximum sensitivity 800 — 900 nm and a strongly drooping volt-ampere characteristic. P. P. Borisov and V. P. Solov'yev took part in the work. The authors thank T. M. Golovner and V. Ya. Koval'skiy for measuring the spectral and load characteristics. Orig. art. has: 6 figures and 2 formulas. [02]

SUB CODE: 20/ SUBM DATE: 21Oct65/ ORIG REF: 006/ OTH REF: 008

ATD PRESS: 6031

Card 2/2

L 04611-67 FSS-2/EWT(1)/EWT(m)/FCC/EWP(t)/ETI IJP(c) JD/TT/GW

ACC NR: AP6033397 SOURCE CODE: UR/0293/66/004/005/0740/0747

AUTHOR: Grigor'yeva, G. M.; Gumennyy, V. A.; Kreynin, L. B.; Landsman, A. P.

ORG: none

TITLE: Investigation of the radiation resistance of silicon photoconverters (according to experimental data obtained by the "Electron-3" artificial Earth satellite)

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 5, 1966, 740-747

TOPIC TAGS: artificial earth satellite, silicon, cosmic radiation, radiation belt, radiation damage, radiation protection, photoelectric detection equipment/ Electron-3 artificial earth satellite

ABSTRACT: "Electron-3" had an apogee of 7040 km and a perigee of 405 km. The inclination angle of its orbital plane to the equatorial plane was 60° 52'. As it orbited the Earth, the satellite intersected regions of intensive corpuscular radiation in the inner and outer radiation belts. Eight DSE experimental photoelectric detectors were installed on "Electron-3". Each detector consisted of a group of several photocells connected in series. The cells were made from p-type silicon into which phosphorus had been diffused. Both coated and uncoated detectors were used. The rapid deterioration of unprotected photocells was due principally to the effect of intensive low-energy proton fluxes (0.1 to 0.5 Mev). The presence of very thin coatings considerably reduced the rate of deterioration. Intensive low-energy proton fluxes (0.2 to 0.3 Mev) with a path length of the order of the depth of the n—p transition caused a sharp decrease in the open-current potential of unprotected photo-

Card 1/2 UDC: 539.104:621.383.8

L 04611-67

ACC NR: AP6033397

cells. Photocell damage produced by electrons on the "Electron-3" was slight. Measurements carried out over three months showed no drop in current in photocells protected with 3-mm-thick glass. Calculations showed that solar cells with 3-mm coatings could operate at least four years with a current reduction no greater than 25 percent. The investigation proved the feasibility of predicting how solar cells subjected to intensive cosmic radiations will react. The authors thank E. N. Sosnovets for computing the integral fluxes of protons and electrons for the orbit of "Electron-3" and N. V. Shavrin and M. M. Koltun for discussing the experimental results. Orig. art. has: 6 figures and 2 tables.

SUB CODE: 04, 22, 20 SUBM DATE: 28Sep65/ ORIG REF: 003/ OTH REF: 005/ ATD PRESS: 5100

Card 2/2 egtr

ACC NR: AP7003153 SOURCE CODE: UR/0368/66/005/006/0770/0773

AUTHOR: Kagan, M. B.; Koltun, M. M.; Landsman, A. P.

ORG: none

TITLE: Reflection coefficient of highly-doped GaAs in the spectral range from 0.2 to 25 μ

SOURCE: Zhurnal prikladnoy spektroskopii, v. 5, no. 6, 1966, 770-773

TOPIC TAGS: solid state laser, semiconductor laser, gallium arsenide, ~~laser material~~, ~~spectroscopy~~, solar cell, light reflection coefficient, optic spectrum

ABSTRACT: Measurements of the regular-reflection coefficient are given for single-crystal p-type GaAs samples with Zn doping (for carrier concentration from 1.7 to $15 \cdot 10^{19}$ cm^{-3}), and n-type samples (for a carrier concentration of $3 \cdot 10^{15}$ cm^{-3}). An SF-4 spectrophotometer is used from 0.2 to 0.75 μ and an IKS-14 spectrophotometer from 0.75 to 25 μ. Several samples were chemically polished and their surface irregularities did not exceed 0.3 μ, while one sample had irregularities of about 1 μ and exhibited a lower reflection coefficient in the ultraviolet and optical region of the spectrum. In the optical region the carrier concentration has little influence on reflection properties. In the infrared, the reflective power increases considerably with free carrier concentration, while at the same time the minimum occurring at wavelengths where the index of refraction approaches unity is shifted

Card 1/2 UDC: 535.39

ACC NR: AP7003153

toward shorter lengths, approximately from 12 to 4 μ. The reflection coefficient can be brought down from 32 to 0.5—1.0% in any given part of the optical spectrum by SiO coatings of suitable thickness (0.21 μ), while MgF_2 and SiO_2 coatings (0.21 μ) are not as effective. Two methods of sharply reducing the reflection from highly-doped single crystals in the 3—25 μ region are discussed. One of these involves coating the surface with irregularities 10—30 μ thick and treating the same chemically; the other — coating the surface with a layer of organic silicon varnish 10—40 μ thick, highly absorbing in the infrared but transparent in the 0.4—1.0 μ regions. In the infrared region, use of silicon-based coatings can increase the thermal radiative power of GaAs surface (at 25°C) from 0.49—0.51 to 0.8—0.92. These coatings do not damage the surface, and good diffused junctions are still possible. One can expect that the use of the above procedures will considerably improve the performance of lasers and solar cells. Orig. art. has: 3 figures.

[WA-14]

SUB CODE: 20/ SUBM DATE: 22Dec65/ ORIG REF: 001/ OTH REF: 002

Card 2/2

ACC NR: AP7002713 (A) SOURCE CODE: UR/0115/66/000/012/0081/0082

AUTHOR: Berman, L. S.; Gliberman, A. Ya.; Kagan, M. B.; Landsman, A. P.

ORG: none

TITLE: Light-sensitive devices of silicon and gallium arsenide, based on barrier layer cells

SOURCE: Izmeritel'naya tekhnika, no. 12, 1966, 81-82

TOPIC TAGS: photovaricaps, photoelectric cell, silicon semiconductor, semiconductor device, gallium arsenide, arsenide, silicon compound, photosensitivity

ABSTRACT:
Semiconducting light-sensitive devices ("photovaricaps") based on barrier layer cells made of silicon and gallium arsenide single crystals and having low series resistance were developed and tested. The size of the photovaricaps ranged from 2 x 2 mm to 10 x 10 mm. The capacity for a unit of area for silicon photovaricaps without external voltage C(0) was approximately 0.027 to 0.030 $\mu F/cm^2$, and for gallium arsenide photovaricaps 0.38 to 0.050 $\mu F/cm^2$. The photovaricaps can operate in a range of sonic and ultrasonic frequencies. The most important parameter of the photovaricaps is the photosensitivity coefficient characterizing the relative change of capacitance per unit of luminous flux Φ. The capacitance temperature coefficient for

Card 1/2 UDC: 621.383